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By

Prof. Yuh-Shan Ho

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# Title: Salud Colectiva

Full Journal Title: Salud Colectiva

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Gonzalez, P.U. (2011), Information systems in health: A conversation with Pedro Urra Gonzalez. *Salud Colectiva*, **7** (1), 99-111.

Abstract: In this conversation, which took place in Havana in October 2010, Pedro Urra Gonzalez recounts the creation of Cuba’s Sistema Nacional de Informacion en Ciencias de la Salud (National Information System in Health Sciences) during the 1960s and the founding of the Infomed project in the beginning of the 1990s. He describes the epistemological frameworks which supported the development of Infomed as a cultural and social process and as a place of confluence of different types of thought, based on a theory of knowledge oriented to respond to the needs of practice and transformation. Grounding himself in a conception of information systems as human, social and historical constructions which cannot be treated as artifacts disconnected from the reality that embeds them, he analyzes bibliometric indicators, the Open Access movement and such regional projects as the Scientific Electronic Library Online (SciELO) and the Red de Revistas Cientificas de America Latina y el Caribe, Espana y Portugal (Redalyc).

Keywords: Access to Information, Bibliometric, Bibliometric Indicators, Cuba, Development, Information, Information Management, Information Science, Information Systems

# Title: Salud Mental

Full Journal Title: Salud Mental

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0185-3325

Issues/Year:

Journal Country

Language:

Publisher: Interperiodica, Birmingham

Publisher Address:

Subject Categories:

Impact Factor

? Agudelo, D., Breton-Lopez, J. and Buela-Casal, G. (2004), Bibliometric analysis of journals related to health psychology published in Spanish. *Salud Mental*, **27** (2), 70-85.

Full Text: [2004\Sal Men27, 70.pdf](2004/Sal%20Men27,%2070.pdf)

Abstract: Nowadays, scientific production has been given, in enormous importance, and, as a consequence interest has been focused also on journals and works itself as mere instruments of knowledge divulgation that contribute to the development of Science. Thus, bibliometric studies have great relevance within the scope of evaluation and assessment of the scientific contents. At the same time, they are most useful to allow a detailed approximation to the object of analysis and, in addition, to the data offered in regard to a given area of knowledge. A bibliometric analysis is achieved in the present work. Moreover, it is made oil the basis of four journals which are directly related to Health Psychology and Mental Health published in Spanish (Rerista Internacional de Psicologia Clinical de la Salud, International Journal of Clinical and Health Psychology, Clinina y Salud, Salud Mental, y Psiciologia y Salud) during 2001 -2002. Several factors have been taken into account when dealing with the detailed study of these journals. In these journals, first of all, it has been analysed, the number of articles which have been published in the selected and previously specified period of time, secondly, the nationality of the authors who have written the different articles, and after, the number of authors who have taken part in each of the works and the area to which their contents belong according to the classification achieved by the authors, and hearing in mind the type of examined articles. Different sections are included Under this classification, so it’s worth mentioning Mental Health, to begin with. Under this heading should be included all those articles focused on psychiatric or psychological interventions related to the mental processes, their attention, pervention and promotion. The second place of the classification is occupied by the heading of physical Health. In this area are grouped all those written articles regarding psychiatric and psychological interventions focused oil physical alteration. In the third place, and under the category of Neurosciences, have been classified the articles focussed on the neuropsychology, experimental pschiatry, neuro and psychophysiology, prescribed drugs and all those areas concerned with the basic processes of the functioning of the brain. Finally, another category was added up. It was the so-called Inter-Area that included all those works that clue to their characteristics, could not be considered as proper or specific of a single area of knowledge. Information obtained after the analysis, reflects the fact that there are substantial differences between the journals, in regard to the number of articles being published. In such a way it is worth mentioning the detached journals of Salud Mental with a total of 85 articles published in these two years. We are lead to think that a having a larger number of annual editions implies to publish larger number of written articles, though this is not necessarily the case. It is, rather, a consequence of other priorities and characteristics pertaining to different journals. On the other hand, as a result of the analysis of different journals, substantial differences can be found in regard to the interventions of authors whose nationalities are not the same as that of the journal’s. In this way, it is worth mentioning the Revista Internacional de Psicologia Clinica y de la Salud, International Journal of Clinical and Healh Psychology, with a contribution of ten different countries -in addition, to the Spanish authors- stressing the contributions of South and Central American Countries and, questioning, as with the other journals, the scarce representation from other European Countries. In contrast to this statement it is important to mention the relevance of the scientific collaboration between the different countries that may be observed in the shared scientific production. This fact also indicates the need to make known the different publications in order to increase the number of contributions from countries other than the journal’s. In this same way, consideration is given to the influence of the diversity of languages in which each journal is published, in order to obtain some contributions from different countries. The index of authorship or the number of signers in each work also reflects different patterns among the journals, however, the great majority of them are oriented towards the so-called multiple,tutorship in,wich the works are signed by several authors, mostly two of them. The analysis of the contents shows the variety of areas of knowledge represented in the works which have been published in the analysed journals. So, in the journal Psicologia y Salud, we call observe a high degree of representation of articles of the area of Physical Health, however, in the Revista Internacional de Psicologia Clinica y de la Salud, International of Clinical and Health Psychology and in Salud Mental the contents are shared among various areas, a fact possibly due to the interests and profile of these journals. Any way, in the three above mentioned journals there is a larger number of written articles related to Mental Health. In addition to this, it is important to indicate that the varied richness of their contents shows the interdisciplinarity that exists in the treatment of Mental Health and also the difficulty in classifying the different treatments in the general and specific categories themselves. Focusing our attention in Salud Mental, it is convenient to point out how among the analysed journals this is the one that Publishes more contributions pertaining to different areas of knowledge, there is a greater number of articles in each of the marked categories, data in the area of Neurosciences is outstanding in comparisson to the rest of the analysed journals. Several final reflections may be made bearing in mind the information provided by this data, its usefulness and implications. Besides, we may point out their practical value for authors, readers and editors of the journals. As far as authorship is concerned, not only do they offer relevant information, in the face of the charcteristics of different journals -dealing with the thematic blocks preferably treated in their publications- but also, they illustrate the rules for publication suggested by each of the journals. Making known these rules, is a useful and valuable contribution, because sometimes the difficulties for publishing arise from to the author’s lack of knowledge regarding publising requirements or even, to and, consequently, they make the wrong selection when sending their works. Taking into account the readers’ positions, these works have a special interest as they orientate the bibliographic search offering a more concrete panorama of the type of available thematic blocks in the different publications. The journals acquire special importance for editors because they produce relevant information about the general characteristics showed in their publications. This could be very useful to implement strategies to give space to a determined type of articles that fit into the journal’s profile.

Keywords: Analysis, Assessment, Authors, Authorship, Bibliographic Search, Bibliometric, Bibliometric Analysis, Bibliometric Studies, Classification, Collaboration, Countries, Depressed-Patients, Descriptive Study Though Data Analysis, Development, Diversity, Evaluation, Health, Health Psychology, Index Of Authorship, Interdisciplinarity, Journal, Journals, Knowledge, Languages, Long-Term Potentiation, Memory-Systems, Mental Health, Mental-Health, Mexico-City, Neurobiological Mechanisms, Neuropsychology, Neurosciences, Part Iii, Posttraumatic-Stress-Disorder, Psychophysiology, Publication, Publications, Publishing, Relevance, Risk Eating Behaviors, Science, Scientific Collaboration, Scientific Production, Spanish, Synaptic Plasticity, Treatment, Usefulness

? Garcia-Silberman, S., Arana, D., Martinez, R., Infante, R. and Jimenez, A. (2004), Research of epidemiological and psychosocial aspects of mental health: A bibliometric 8 analysis. *Salud Mental*, **27** (5), 8-22.

Full Text: [2004\Sal Men27, 8.pdf](2004/Sal%20Men27,%208.pdf)

Abstract: The main objective of this paper is to describe the most important characteristics of the scientific work developed at the Direccion de Investigaciones Epidemiologicas y Psicosociales (DIEP) from the Instituto Nacional de Psiquiatria Ramon de la Fuente (INPRF), using printed material as an indicator to evaluate productivity. We consider important to make a descriptive and critical analysis of the development of knowledge generated and disseminated with the purpose of having it as a base for planning future activities after twenty-five years of scientific activity in epidemiological and psychosocial research. Bibliometric analysis is a tool developed to perform quantitative studies of printed matter, it seeks to show numbers related to research activities through description of printed publications in a particular field. On this paper, we are trying to give a panoramic view of the different topics, the specific population groups studied, the methods used, as well as the different pathways and tendencies in these twenty-five years. This allows for the identification of particular fields that have been underestimated and which can be considered as starting point for the development of future research. The analysis of each document has been defined in three basic aspects: content, authors, and dissemination media used. This strategy made it possible for us to know the amount of the production and its quantitative and qualitative characteristics in terms of type of publication, the country where it was published, the assignment and nationality Of the authors, the number of authors by article, the type of research and its subject matter, the population studied, and the amount of publications per year. All the material used in this study belongs to a bibliographic database (BIBLISMAD), which is permanently updated and which gathers more than 5000 references of research reports published in Mexico or by Mexican researchers, among them all those who are or were part of the DIEP. All the references corresponding to documents that had been published were considered, including articles in journals, book chapters, complete books, manuals and reasearch instruments. References corresponding to unpublished works, summaries in memories and communications presented in congresses were excluded. The selection of the material was carried out considering the fact that at least one of the authors was assigned to the DIET when the paper was published or during the period when the research was performed. The bibliographic material was analyzed considering different aspects of each one in the manner of variables. This way we registered the type of publication (full book, manual, article in journal, book chapter, instrument, and report), the type of article (empiric research, review, and essay), the country of the journal or book, the number of authors by paper, articles where the main author was part of the DIEP, assignment of the authors (researcher form the DIEP, external national researcher, and external foreign researcher), the type of empirical research performed (quantitative or qualitative), the field of research (mental health or addictions), and the population under study (children, adolescents, adults, and elderly people). Apart from mere quantification and the kind of papers published, we considered a qualitative analysis as a very important aspect. In this case, we worked with the contents of each manuscript to identify general areas, particular topics, methods applied, populations researched, and the media chosen to publish. With this, we attempted to obtain indicators of the relative weight of each item. For this study, we analyzed an overall of 1457 works published between 1978 and 2003. Results are presented according to the type of publication, the authorship, and the main topic. The analysis allowed building a map of the research performed by the DIEP in the last twenty-five years. We found that most of the material corresponded to articles in scientific journals, most of them Mexican, almost a third American, and a fifth European. Regarding language, more than a half of the articles are in Spanish, nearly 40% are in English and small percentages are in French and Portuguese. As for the specialty of the publications, most of them were published in psychology, psychiatry, mental health, and addiction journals. Nevertheless, due to the characteristics of psychosocial research, 24% of the papers were published in different medic magazines (general practice, public health, epidemiology, pediatrics, geriatrics, AIDS treatment, biomedical sciences, gynecology, cancerology, neurology, nutrition, perinatology, sexuality and reproductive health), 17% in social sciences and humanities journals (culture, education, adolescence, anthropology, social work, family), and 3% in science and technology magazines. Tendencies in productivity were satisfactory, with variations related to the nature of research, which is devoted to data collection and analysis in some periods and in others to the publication of results. Broadly speaking, there was an increase in productivity. This increase was more obvious between 1984 and 1994, which may be explained by an institutional growth in terms of financial and human resources. This growth tended to stabitize in the last decade, in spite of which productivity has not stopped growing. When we analyzed data related to authorship, there was a marked leadership on the side of the DIEP researchers: 90% of the articles published had a researcher from the DIEP as the main author. In the other hand, there were 286 co-authors from Mexico and 204 from other countries, which is a sign of the great interest to work with different groups from institutions all over the country and overseas. Although the production average level seems to be low, this is explained by the fact that many authors have collaborated temporally as post-graduate students, students writing their dissertation, and students in social service. One indicator of the important role of the DIEP as a generator of original knowledge in mental health and addiction fields is the high percentage of papers reporting results of researches developed by this area of the institute. The frequency of quantitative methods is a reflex of the predominance of this perspective in science, and in health sciences particularly. However, the growing development that qualitative and mixed methods have had during this last decade is noteworthy. This implies an enrichment of the amount and out reach of the knowledge generated in our field of work. The diversity of topics allows for a thought about the great advance experienced by mental health in recent years, especially in epidemiologic and psicosocial regards. However, it must be said that there are still many challenges to face.

Keywords: Bibliometry, Disorders, General Psychiatric Journals, Mental Health, Psychosocial Research, Science, Trends

? Godoy, M.E.R., Navarro, E. and Escoto, A.S.D. (2008), Editorial productivity impact of the National Institute of Psychiatry Ramon de la Fuente, between the years 1995-2005, accoding to the Institute of Science Information Web of Science. *Salud Mental*, **31** (1), 3-17.

Full Text: [2008\Sal Men31, 3.pdf](2008/Sal%20Men31,%203.pdf)

Abstract: The immediate expression of the scientific activity is very well reflected through the serial journals, due to the fact that they are the main means of information that scientists have chosen to communicate to their peers and society as a whole the advances and recent contributions of research that is being done. Thus explaining in this manner the reason why bibliometric studies are of great utility to highlight the evolution of the scientific research, also, this allows scientists, institutions and, editors of scientific journals to be aware of a series of indicators to analyze science productivity from different angles. In this study, the editorial productivity of the National Institute of Psychiatry Ramon de la Fuente (NIPRF), and its journal Solud Mental included in two indexes of the ISI Web of Science: 1) The Social Science Citation Index (SSCI), 2) The Science Citation Index (SCI) and The Journal Citation Reports (JCR), by Thompson Scientific, between the years 1995 - 2006. The objective of the study is to make public the editorial productivity of the institution, research staff and their journal Solud Mental, according to the mentioned information sources. These databases were selected for this study because of the prestige that Thompson Scientific has not only in the scientific community, but also, in the information media, due to its rigorous methods to select the journals in order to maintain updated journal titles that are included in their indexes. This study shows the productivity of different countries of the world in the SSCI in the period analyzed to place Mexico in the international context. Then, it is shown all the productivity of Mexico in the SSCI by author, subject, institution, publication, type of document and language, with the purpose of knowing the position of productivity of the NIPRF in the national context. After this, all the productivity of the NIPRF contained in the SCI is presented with the total productivity of the institute in both indexes. Afterwards, a chart is shown of the productivity of the authors belonging to the institute that appear in both indexes, showing the number of articles as single authors and as first authors, as well as identifying the type of documents published. The study follows with a series of data of the productivity of three Mexican journals indexed in the SSCI related to subjects such as psychology and psychiatry, they are: Salud Publica de Mexico, Solud Mental and, Revista Mexicana, de Psicologia, with the purpose of identifying the institutions journal Salud Mental in the national and international context. The impact factor of the three Mexican journals was obtained from the Journal Citation Reports Edition. All the productivity of the three journals was analyzed by author, institution, type of document and language. The Mexican scientific productivity in social sciences, according to the SSCI, is very low compared with the other countries that were analyzed, in the case of Latin America, only Brazil exceeds Mexico in editorial production in this subject. According to the SSCI, the recurrent subjects in the editorial production in the social sciences are related with subjects such as psychology and psychiatry and the authors that stand out in this study are from the NIPRF. It is worth pointing out the fact that most of the editorial production of Mexico in this field according to the SSCI is generated in public institutions, first of all, the National Autonomous University of Mexico followed by the National Institute of Psychiatry Ramon de la Fuente.

Keywords: Advances, Bibliometric, Bibliometric Studies, Bibliometrics, Brazil, Community, Context, Data, Databases, Evolution, Expression, Field, First, Health, Impact, Impact Factor, Indicators, Information, Institutions, International, ISI, ISI Web of Science, Journal, Journal Citation Reports, Journals, Latin America, Media, Methods, Mexico, National Institute of Psychiatry Ramon de la Fuente (NIPRF), Productivity, Psychiatry, Psychology, Public, Publication, Purpose, Research, SCI, Science, Science Citation Index, Sciences, Scientific Journals, Scientific Productivity, Scientific Research, Social, Social Science Citation Index, Social Sciences, Society, Sources, SSCI, Utility, Web of Science, World

? Rojas, E., Real, T., Garcia-Silberman, S. and Medina-Mora, M.E. (2011), A systematic review of addiction treatment in Mexico. *Salud Mental*, **34** (4), 351-365.

Full Text: 2011\Sal Men34, 351.pdf

Abstract: The consumption of substances with addictive potential is a relevant health problem. In Mexico, the abuse is spreading and the use of services is unfrequent. To extend the offer and accessibility to treatment means to increase the coverage and to guarantee that efficient and effective models are used to treat the patients. The aim of the paper was to learn what has been investigated in this respect; a systematic review of the studies was undertaken to evaluate the treatment research through clinical trials. Methods A review of the published literature from 1980 to 2010 in databases and specialized documentation centers was undertaken. Reports of clinical trials to evaluate interventions for the consumption of alcohol, tobacco and drugs were included. The criteria proposed by CONSORT were used as indicators. Results Two hundred and twenty publications were located on treatment in Mexico, of which only 26 (11.8 %) corresponded to clinical trials to evaluate the impact of different interventions. The most used type of treatment was the cognitive-behavioral brief one, followed by its combination with therapy of replacement, pharmacological therapy and individual psychotherapy or group therapy. Trials also included evaluation of motivational brief therapy, the program “La familia ensenante” (teaching family) and psychotherapy, as well as the therapy centered on solutions. Discussion Most of the clinical trials localized do not comply with the criteria or do it partially. Additionally they have short scopes due to the limited size of the samples. The results reveal that the reports published of investigations are very scanty to evaluate programs of treatment. There is a need to implement programs of treatment directed to specific populations and to the use of different types of drugs, and to evaluate the interventions.

Keywords: Addiction, Addictions, Alcohol, Bibliometric Analysis, Clinical Trials, Clinical-Trials, Consort, Countries, Coverage, Databases, Delay, Disorders, Documentation, Drugs, Evaluation, Family, Group Therapy, Impact, Interventions, Literature, Mental-Health-Services, Methods, Mexico, Patients, Psychotherapy, Publications, Reports, Research, Review, Systematic, Systematic Review, Teaching, Therapy, Tobacco, Treatment

# Title: Salud Publica de Mexico

Full Journal Title: Salud Publica de Mexico

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0036-3634

Issues/Year:

Journal Country

Language:

Publisher: Interperiodica, Birmingham

Publisher Address:

Subject Categories:

Impact Factor

? Diaznieto, L., Galancuevas, S. and Fernandezpardo, G. (1993), A self-care experience in diabetes-mellitus type-II patients. *Salud Publica de Mexico*, **35** (2), 169-176.

Full Text: Sal Pub Mex35, 169.pdf

Abstract: The present work presents the experience of a diabetes self-care group in San Antonio Tecomitl, Milpa Alta, D.F., Mexico. Diabetes is a serious disease posing a public health problem in our country, since it affects a great number of productive age persons, causing, if uncontrolled, deleterious effects on their life quality and expectancy because of vascular and neural complications. We carried out an intervention in six female patients diagnosed as having diabetes mellitus type II, with different stages of the disease, all of them were residents of Milpa Alta municipality, with an average age of 63.6 years. They were receiving different doses of oral hypoglycemic agents. The group of patients met once a week for two-hour sessions in wich they received: a) information about diabetes mellitus, b) self-care training and c) profound relaxation techniques. In each session we evaluated glycemia, body weight and blood pressure in each patient. Results from the intervention showed no correlation between body weight and blood pressure, though there was a significant variation in glycemia levels after the intervention.

Keywords: Psychology, Behavior, Health, Diabetes-Mellitus Type-II, Self-Care Groups

? Marquina, R.G. and Aviles, C.G.E. (2003), The severe acute respiratory syndrome: A new public health challenge. *Salud Publica de Mexico*, **45** (2), 146-147.

Full Text: [2003\Sal Pub Mex45, 146.pdf](2003/Sal%20Pub%20Mex45,%20146.pdf)

# Title: Sampe Journal

Full Journal Title: Sampe Journal

ISO Abbreviated Title: Sampe J.

JCR Abbreviated Title: Sampe J

ISSN: 0091-1062

Issues/Year:

Journal Country

Language:

Publisher: Sampe Publishers, Covina

Publisher Address:

Subject Categories:

Impact Factor

? Ndubizu, C.C., Brown, R.A., Tatem, P.A. and Williams, F.W. (2001), Fire hazard assessment in submarine plastic waste stowage compartments. *Sampe Journal*, **37** (4), 42-48.

Abstract: The paper discusses the results of fire tests designed to quantify the hazards associated with the onboard stowage of the plastic waste bags in proposed stowage compartments for two submarine classes. Ignition tests were conducted with the waste bags outside the compartment. Fire growth and fire extinguishment tests were conducted with the bags inside the compartment with the door open and with the door closed. The test results indicate that the bags are difficult to ignite. Flame spread radially into the bag is difficult because of compaction of the contents. With the door open, fire in the stowage compartment can grow to about a 600 KW fire if the forced ventilation was off or 400 KW fire if the ventilation was on. In each case the fire produced very thick smoke in the early stages. In the closed-door tests, the fire was oxygen limited whether the ventilation was on or off and and the maximum heat release rate was about 1/3 that with the door open. Tn the partially closed door compartment test the fire was also oxygen limited and the maximum heat release rate was of the order of 200 KW. Therefore, fire hazard will be greatly reduced if the door is closed and the forced ventilation is secured. In every test, the fire at its worst stage is controllable in less than one minute using one unit of bottled Aqueous Film-Forming Foam (AFFF) or a 1.9 cm water hose line. There is, however, a need to thoroughly overhaul the fire after the flames are out.

# Title: Sangyo Ika Daigaku Zasshi

Full Journal Title: Sangyo Ika Daigaku Zasshi

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Schrauzer, G.N. (1987), Effects of selenium antagonists on cancer susceptibility: New aspects of chronic heavy metal toxicity. *Sangyo Ika Daigaku Zasshi*, **9** Suppl, 208-215.

Abstract: Uptake, transport, metabolism and physiological activity of selenium are influenced by interactions with a variety of heavy metals. With elements exhibiting especially high affinities for selenium, significant interactions may occur at concentrations close to the no-effect threshold levels. At low dietary Se intakes, this may produce states of latent Se deficiency as well as increased susceptibility to cancer development. In experiments with MMTV-infected female mice, exposures to low levels of the Se-antagonistic elements As, Pb and Cd in the drinking water abolish the cancer-protecting effects of Se. At higher exposure levels, these elements may act as inhibitors or promotors of malignant transformation and tumor growth. These findings are of potential importance to human health as the contaminant levels of Se-antagonistic elements in foods and in the environment result in exposures which often significantly exceed the dietary Se intakes.

# Title: Sao Paulo Medical Journal

Full Journal Title: [Sao Paulo Medical Journal](http://www.scielo.br/scielo.php?script=sci_issues&pid=1516-3180&lng=en&nrm=iso)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1516-3180

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Grieger, M.C.A. (2005), Authorship: An ethical dilemma of science. *Sao Paulo Medical Journal*, **123** (5), 242-246.

Full Text: [2005\Sao Pau Med J123, 242.pdf](2005/Sao%20Pau%20Med%20J123,%20242.pdf)

Abstract: CONTEXT AND OBJECTIVE: The scientific and technological progress that has taken place since the 1960s has brought an ever-growing volume of scientific research, and inflation in co-authorship. Over this period, it has been observed that an increasing number of publications have listed authors or co-authors whose participation in the published research was minimal or even nonexistent. The objective of this work was to analyze reports in the literature regarding misconduct in authorship: its types, chief causes, consequences and ethical guidelines, and to outline proposals for greater ethical commitment in scientific publication. DESIGN AND SETTING: Narrative review undertaken at Faculdade de Medicina de Itajubá, Minas Gerais, Brazil. METHODS: Analysis of publications about authorship using the Medline, Lilacs and SciELO databases. RESULTS AND CONCLUSIONS: Frequent types of misconduct were gift authorship and divided and redundant publications. The chief causes of these practices seem to be the pressure exerted by academia and the desire for social and professional development. Such factors have brought an increase in unethical behavior. This bias in science continues despite the criteria defined by the International Committee of Medical Journal Editors, the Vancouver group. RECOMMENDATIONS: Various actions are proposed for educational institutions, research development agencies, regulatory agencies and professional associations. The aim is to establish an evaluation policy that gives primacy to the quality of publications and sets ethical principles for scientific research.

Keywords: Authorship, Ethics, Science, Scientific Misconduct, Publications

? Sass, N., Itamoto, C.H., Silva, M.P., Torloni, M.R. and Atallah, A.N. (2007), Does sodium nitroprusside kill babies? A systematic review. *Sao Paulo Medical Journal*, **125** (2), 108-111.

Full Text: 2007\Sao Pau Med J125, 108.pdf

Abstract: OBJECTIVE: To determine whether sodium nitroprusside causes fetal death in pregnancies complicated with hypertension. DATA SOURCES: Medical Literature Analysis and Retrieval System Online (MEDLINE; 1996 to 2003), Excerpta Medica (EMBASE; 1970 to 2003), Web of Science/Institute for Scientific Information (ISI; 1945 to 2003), Literatura Latino-Americana e do Caribe em Ciencias da Saude (LILACS; 1982 to 2003) and the Cochrane Library. REVIEW METHODS: The medical subject headings used were “nitroprusside and pregnancy”, “hypertension or eclampsia or preeclampsia” and “nitroprusside and pregnancy and hypertensive emergencies”. The search was limited to humans and female gender, in all fields, publication types, languages and subsets. Articles were also identified by reviewing the references of articles and textbooks on hypertension and pregnancy. RESULTS: The search located nine studies. The sum of all the publications yielded a total of 22 patients and 24 exposed fetuses (two pairs of twins). There were no randomized clinical trials and no prospective cohorts. All of the studies were observational in nature. CONCLUSIONS: At present, there is insufficient evidence for definitive conclusions about any direct association between sodium nitroprusside use and fetal demise.

Keywords: Articles, Clinical Trials, Cochrane, Embase, Fetal Death, Fetal Mortality, Gender, High-Risk Pregnancy, Humans, Hypertension, ISI, Literature, Medical, Medline, Nitroprusside, Observational, Pregnancy, Publication, Publications, Randomized Clinical Trials, Review, Reviewing, Scientific Information, Systematic, Systematic Review, Textbooks, Twins

? Riera, R., de Soarez, P.C., Puga, M.E.D. and Ferraz, M.B. (2009), Lapatinib for treatment of advanced or metastasized breast cancer: Systematic review. *Sao Paulo Medical Journal*, **127** (5), 295-301.

Full Text: 2009\Sao Pau Med J127, 295.pdf

Abstract: Context and objective: Around 16% to 20% of women with breast cancer have advanced, metastasized breast cancer. At this stage, the disease is treatable, but not curable. The objective here was to assess the effectiveness of lapatinib for treating patients with advanced or metastasized breast cancer. Design and setting: Systematic review of the literature, developed at centro paulista de economia da saude (Cpes), Universidade federal de sao paulo (Unifesp). Method: Systematic review with searches in virtual databases (PUBMED, lilacs [Literatura latino-americana e do caribe em ciencias da saude], Cochrane library, scirus and Web of Science) and manual search. Results: Only one clinical trial that met the selection criteria was found. This study showed that lapatinib in association with capecitabine reduced the risk of cancer progression by 51% (95% Confidence interval, ci: 0.34-0.71; P < 0.001), Compared with capecitabine alone, without any increase in severe adverse effects. Conclusion: The combination of lapatinib plus capecitabine was more effective than capecitabine alone for reducing the risk of cancer progression. Further randomized clinical trials need to be carried out with the aim of assessing the effectiveness of lapatinib as monotherapy or in association for first-line or second-line treatment of advanced breast cancer.

Keywords: Adverse Effects, Antineoplastic Agents, Antineoplastic Protocols, Breast Cancer, Breast Neoplasms, Cancer, Chemotherapy, Clinical Trial, Clinical Trials, Cochrane, Databases, Disease, Effectiveness, Egfr Family, Gw572016, Inhibitor, Literature, Monotherapy, Progression, Randomized Clinical Trials, Receptor,Erbb-2, Review, Risk, Safety, Science, Single-Agent, Systematic, Systematic Review, Teach, Therapy, Trastuzumab, Treatment, Tykerb Evaluation, Web of Science, Women

? Riera, R. (2009), Designs of studies published in two Brazilian journals of orthopedics and sports medicine, recently indexed in the ISI Web of Science. *Sao Paulo Medical Journal*, **127** (6), 355-358.

Full Text: 2009\Sao Pau Med J127, 355.pdf

Abstract: CONTEXT and OBJECTIVE: The methodology and relevance of articles are among the keystones for promoting their citation and increasing journals’ impact factors. Study designs appropriate for answering the questions and adequate sample sizes have the aim of reducing the risk of bias. This study evaluated the articles published in two Brazilian journals of orthopedics and sports medicine that were recently indexed in the ISI Web of Science, regarding study design, sample size calculation, randomization and blinding. DESIGN and SETTING: Descriptive study at Brazilian Cochrane Center, METHODS: Through a manual search, all original manuscripts published in 2007 in Acta Ortopedica Brasileira and Revista Brasileira tie Medicine do Esporte were selected and evaluated. RESULTS: All the 60 articles published in Acta Ortopedica Brasileira and the 87 articles in Revista Brasileira de Medicine do Esporte were included and evaluated. The commonest design in Acta Ortopedica Brasileira was experimental studies (n = 19) and in Revista Brasileira de Medicine do Esporte, update or review articles (n = 14). Sample calculations were seen in a minority of the articles. None of the eight clinical trials published presented sample calculations or adequate randomization processes. Three were described as blinded, but none described the measures taken to prevent disclosure of the allocation concealment. CONCLUSIONS: Publication of studies of good methodological quality other than review and experimental studies should be strongly encouraged among Brazilian journals, with the aim of increasing their citation and therefore their impact factor.

Keywords: Bias, Citation, Clinical Trials, Cochrane, Context, Design, Disclosure, Impact, Impact Factor, Impact Factors, ISI, Isi Web of Science, Journal Impact Factor, Journals, Medicine, Methodology, Methods, Periodicals As Topic, Publications, Research Design, Review, Risk, Science, Sports, Web of Science

? Macedo, C.R., da Silva, D.L. and Puga, M.E. (2010), Methodological adequacy of articles published in two open-access Brazilian cardiology periodicals. *Sao Paulo Medical Journal*, **128** (2), 85-89.

Full Text: [2010\Sao Pau Med J128, 85.pdf](2010/Sao%20Pau%20Med%20J128,%2085.pdf)

Abstract: CONTEXT AND OBJECTIVE: The use of rigorous scientific methods has contributed towards developing scientific articles of excellent methodological quality. This has made it possible to promote their citation and increase the impact factor. Brazilian periodicals have had to adapt to certain quality standards demanded by these indexing organizations, such as the content and the number of original articles published in each issue. This study aimed to evaluate the methodological adequacy of two Brazilian periodicals within the field of cardiology that are indexed in several databases and freely accessible through the Scientific Electronic Library Online (SciELO), and which are now indexed by the Web of Science (Institute for Scientific Information, ISI). DESIGN AND SETTING: Descriptive study at Brazilian Cochrane Center. METHODS: All the published articles were evaluated according to merit assessment (content) and form assessment (performance). RESULTS: Ninety-six percent of the articles analyzed presented study designs that were adequate for answering the objectives. CONCLUSIONS: These two Brazilian periodicals within the field of cardiology published methodologically adequate articles, since they followed the quality standards. Thus, these periodicals can be considered both for consultation and as vehicles for publishing future articles. For further analyses, it is essential to apply other indicators of scientific activity such as bibliometrics, which evaluates quantitative aspects of the production. dissemination and use of information, and scientometrics, which is also concerned with the development of science policies, within which it is often superimposed on bibliometrics.

Keywords: Access to Information, Bibliometrics, Cardiology, Disease, Epidemiologic Research Design, Heart, Impact Factor, Index, Individuals, Life, Methods, Publications, Risk, Scientometrics, Stenosis, Web, Web of Science

? Grimberg, A., Shigueoka, D.C., Atallah, A.N., Ajzen, S. and Iared, W. (2010), Diagnostic accuracy of sonography for pleural effusion: Systematic review. *Sao Paulo Medical Journal*, **128** (2), 90-95.

Full Text: 2010\Sao Pau Med J128, 90.pdf

Abstract: CONTEXT and OBJECTIVE: The initial method for evaluating the presence of pleural effusion was chest radiography. Isolated studies have shown that sonography has greater accuracy than radiography for this diagnosis; however, no systematic reviews on this matter are available in the literature. Thus, the aim of this study was to evaluate the accuracy of sonography in detecting pleural effusion, by means of a systematic review of the literature. DESIGN and SETTING: This was a systematic review with meta-analysis on accuracy studies. This study was conducted in the Department of Diagnostic Imaging and in the Brazilian Cochrane Center, Discipline of Emergency Medicine and Evidence-Based Medicine, Department of Medicine, Universidade Federal de Sao Paulo (Unifesp), Sao Paulo, Brazil. METHOD: The following databases were searched: Cochrane Library, MEDLINE, Web of Science, EMBASE and Literatura Latino-Americana e do Carte em Ciencias da Saude (Lilacs). The references of relevant studies were also screened for additional citations of interest. Studies in which the accuracy of sonography for detecting pleural effusion was tested, with an acceptable reference standard (computed tomography or thoracic drainage), were included. RESULTS: Four studies were included. All of them showed that sonography had high sensitivity, specificity and accuracy for detecting pleural effusions. The mean sensitivity was 93% (95% confidence interval, CI: 89% to 96%), and specificity was 96% (95% CI: 95% to 98%). CONCLUSIONS: In different populations and clinical settings, sonography showed consistently high sensitivity, specificity and accuracy for detecting fluid in the pleural space.

Keywords: Accuracy, Brazil, Chest Radiography, Citations, Cochrane, Computed Tomography, Context, Critically-Ill Patients, Databases, Design, Diagnosis, Diagnostic Imaging, Interest, Literature, Meta-Analysis, Meta-Analysis [Publication Type], Pleural Effusion, Radiography, Rapid Detection, Review, Review [Publication Type], Science, Sensitivity, Sensitivity and Specificity, Specificity, Surgeon-Performed Ultrasonography, Systematic, Systematic Review, Systematic Reviews, Trauma Ultrasound Examination, Ultrasonography, Web of Science

? Torloni, M.R. and Riera, R. (2010), Design and level of evidence of studies published in two Brazilian medical journals recently indexed in the ISI Web of Science database. *Sao Paulo Medical Journal*, **128** (4), 202-205.

Full Text: 2010\Sao Pau Med J128, 202.pdf

Abstract: Context and objectives: The level of evidence and methodological quality of articles published in medical journals are important aids for clinicians in decision-making and also affect journals’ impact factor. Although systematic reviews (Sr) Are considered to represent the highest level of evidence, their methodological quality is not homogeneous and they need to be as carefully assessed as other types of study. This study aimed to assess the design and level of evidence of articles published in 2007, in two recently indexed brazilian journals (Clinics and revista da associacao medica brasileira), and to evaluate the methodological quality of the srs. Design and setting: Descriptive study developed in the brazilian cochrane center, universidade federal de sao paulo. Methods: All 289 published articles were classified according to types of study design and level of evidence. The srs were critically appraised by two evaluators using the amstar tool. Results: The most frequent design types were cross-sectional studies (39.9%), Case reports (15.8%), Experimental studies (10.8%) and narrative reviews (7.4%). According to the oxford criteria, 25.6% of the articles were classified as level 4 or 5 evidence, while 2.8% Were level 1. Srs represented only 2% of the published articles and their methodological quality scores were low. Conclusions: The main design types among the published papers were observational and experimental studies and narrative reviews. Srs accounted for a small proportion of the articles and had low methodological scores. Brazilian medical journals need to encourage publication of greater numbers of clinically relevant papers of high methodological quality.

Keywords: Anterior Cruciate Ligament, Care, Case Reports, Decision Making, Decision-Making, Design, Impact, Impact Factor, ISI, Isi Web of Science, Journal Article [Publication Type], Journal Impact Factor, Journals, Medical, Medical Journals, Metaanalysis, Methods, Observational, Papers, Periodicals As Topic, Publication, Reconstruction, Research Design, Review [Publication Type], Risk, Science, Systematic, Systematic Reviews, Web of Science

? Cabello, J.B., Burls, A., Emparanza, J.I., Bayliss, S. and Quinn, T. (2010), Oxygen therapy for acute myocardial infarction. *Sao Paulo Medical Journal*, **128** (6), 378.

Full Text: 2010\Sao Pau Med J128, 378.pdf

Abstract: BACKGROUND: Oxygen (O2) is widely recommended for patients with myocardial infarction yet a narrative review has suggested it may do more harm than good. Systematic reviews have concluded that there was insufficient evidence to know whether oxygen reduced, increased or had no effect on the heart ischaemia or infarct size. OBJECTIVE: To review the evidence from randomized controlled trials to establish whether routine use of inhaled oxygen in acute myocardial infarction (AMI) improves patient-centered outcomes, in particular pain and death. CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW: The following bibliographic databases were searched (to the end of February 2010): Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library), MEDLINE, MEDLINE In-Process, EMBASE, CINAHL, Lilacs and PASCAL, British Library ZETOC, Web of Science ISI Proceedings. Experts were also contacted to identify any studies. No language restrictions were applied. SELECTION CRITERIA: Randomized controlled trials of people with suspected or proven AMI, less than 24 hours after onset, in which the intervention was inhaled oxygen (at normal pressure) compared to air and regardless of co-therapies provided these were the same in both arms of the trial. DATA COLLECTION and ANALYSIS: Two review authors independently reviewed the titles and abstracts of identified studies to see if they met the inclusion criteria and independently undertook the data extraction. The quality of studies and the risk of bias were assessed according to guidance in the Cochrane Handbook. The primary outcomes were death, pain and complications. The measure of effect used was the relative risk (RR). MAIN RESULTS: Three trials involving 387 patients were included and 14 deaths occurred. The pooled RR of death was 2.88 (95% CI 0.88 to 9.39) in an intention-to-treat analysis and 3.03 (95% CI 0.93 to 9.83) in patients with confirmed AMI. While suggestive of harm, the small number of deaths recorded meant that this could be a chance occurrence. Pain was measured by analgesic use. The pooled RR for the use of analgesics was 0.97 (95% CI 0.78 to 1.20). AUTHORS’ CONCLUSIONS: There is no conclusive evidence from randomized controlled trials to support the routine use of inhaled oxygen in patients with acute AMI. A definitive randomized controlled trial is urgently required given the mismatch between trial evidence suggestive of possible harm from routine oxygen use and recommendations for its use in clinical practice guidelines.

Keywords: Acute, Acute Myocardial Infarction, Analysis, Authors, Bias, Bibliographic, Bibliographic Databases, Cochrane, Collection, Criteria, Databases, Guidelines, Intervention, Ischaemia, ISI, Myocardial Infarction, Normal, Outcomes, Pain, Practice, Practice Guidelines, Pressure, Primary, Randomized Controlled Trial, Randomized Controlled Trials, Relative Risk, Review, Risk, Science, Selection, Systematic, Therapy, Web of Science

# Title: Saudi Medical Journal

Full Journal Title: [Saudi Medical Journal](http://www.smj.org.sa/Contents_Next.asp)

ISO Abbreviated Title: Saudi Med. J.

JCR Abbreviated Title: Saudi Med J

ISSN: 0379-5284

Issues/Year:

Journal Country Saudi Arabia

Language: English

Publisher: Saudi Med J, Riyadh

Publisher Address:

Subject Categories:

Impact Factor

? Paul, T., Almas, K. and Maktabi, A. (1998), Fluoride content of bottle drinking water in Saudi Arabia and its relation to the prescription of preventive regimens. *Saudi Medical Journal*, **19** (1), 32-35.

Abstract: Objective: In recent years, bottled drinking water have been replacing tap water in Saudi Arabia and other parts of the world. The objective of the present investigation was to report on the fluoride content of bottled drinking water available in Saudi Arabia on the basis of manufacturer’s labelling and to assess the need of daily fluoride supplement based on our findings. Material and Methods: Fluoride content from the label of 26 different brands of still and sparkling water were investigated, tabulated and assessed for relative daily intake. Results: This study shows that these bottles of water contain different concentrations of fluoride, ranging from 0.01 to 0.8 mg/L, while most of the imported brands did not indicate their fluoride content on the labels. Conclusion: This study concludes that some children may be getting more than the recommended dose of fluoride while others may require further fluoride supplements. It is recommended that dentists should be aware of the fluoride content of the drinking water before prescribing fluoride supplements.

Keywords: Fluoride, Bottled Water, Dental Caries, Fluorosis

? Al-Mobeireek, A.F. and Saleemi, S.A. (2003), Facing the severe acute respiratory syndrome epidemic - Hope for the best and prepare for the worst. *Saudi Medical Journal*, **24** (4), E1-E2.

? Tadmouri, G.O. and Bissar-Tadmouri, N. (2004), A major pitfall in the search strategy on PubMed. *Saudi Medical Journal*, **25** (1), 7-10.

Full Text: [2004\Sau Med J25, 7.pdf](2004/Sau%20Med%20J25,%207.pdf)

? Bissar-Tadmouri, N. and Tadmouri, G.O. (2009), Bibliometric analyses of biomedical research outputs in Lebanon and the United Arab Emirates (1988-2007). *Saudi Medical Journal*, **30** (1), 130-139.

Full Text: [2009\Sau Med J30, 130.pdf](2009/Sau%20Med%20J30,%20130.pdf)

Abstract: Objective: We assessed the role of bibliometric methods in representing quantitative and qualitative differences in biomedical research outputs in Lebanon and the United Arab Emirates (UAE). Methods: Data on biomedical research productivity for years 1988-2007 were obtained from PubMed then imported into a specifically designed local database system and normalized to the population size for each Country. Results: Data reveal a continuous increase in research production in Lebanon, whereas a plateau phase is observed in the UAE between 1998 and 2007. In Lebanon, most of the citations originated from the capital city of Beirut, mainly the American University of Beirut. Detailed analysis of biomedical research objectives in Lebanon indicate a focus on internal medicine, anesthesiology, surgery, transplantation, medical genetics, pediatrics, obstetrics, neoplasms, and pain management. In the UAE, most of the biomedical publications originate from Al-Ain University Detailed analysis of biomedical research objectives in the UAE indicate developed interest in pediatrics, obstetrics, clinical dysmorphologies, transplantation, dermatology, diabetes, and consanguinity. Conclusion: Biomedical research outputs quickly recovered in Lebanon following a long war (1974-1992) mainly supported by uninterrupted activities in private higher education institutes. In the UAE, the plateau phase for biomedical research output size could be due to the limitation of most of the research in the country to Al-Ain University. This situation may only improve when other institutes offering biomedical programs engage also in research activities.

Keywords: Al-Ain, American, Analyses, Analysis, Anesthesiology, Arab, Beirut, Bibliometric, Bibliometric Methods, Biomedical, Biomedical Research, Capital, Citations, Clinical, Consanguinity, Corporation-Council Countries, Country, Database, Databases, Developed, Diabetes, Education, Genetics, Geography, Higher Education, Information, Lebanon, Limitation, Local, Management, Medical, Medicine, Methods, Neoplasms, Obstetrics, Pain, Pain Management, Pediatrics, Population, Production, Productivity, Publications, Pubmed, Qualitative, Research, Research Productivity, Role, Science, Size, Surgery, Transplantation, United Arab Emirates, University, War, World

# Title: Scandinavian Journal of Caring Sciences

Full Journal Title: Scandinavian Journal of Caring Sciences

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Jacobsen, R., Moldrup, C., Christrup, L. and Sjogren, P. (2009), Patient-related barriers to cancer pain management: A systematic exploratory review. *Scandinavian Journal of Caring Sciences*, **23** (1), 190-208.

Abstract: The aim of this review was to systemically explore the current evidence regarding patient-related barriers to cancer pain management to find new areas that might be important for better understanding of patient barriers’ phenomenon. The method used in this study was a computerised literature search, carried out in Cochrane Library, MEDLINE (through PUBMED), Web of Science and EMBASE databases for the period 1994-2005. Thirty-seven studies, dealing with cognitive, sensory and affective patient-related barriers, as well as studies, describing patients’ pain communication and their adherence to analgesic regimen were included and analysed. The dominant part of articles studied cognitive patient-related barriers to cancer pain management, while affective, sensory barriers, as well as pain communication and pain medication adherence were studied in much less extend. However, the findings from different studies regarding relationships between cognitive barriers and pain intensity were not consistent. On the contrary, the quality of pain communication was consistently found to be not satisfactory in some key areas. The associations between more expressed attitudinal as well as sensory barriers and less optimal adherence were also consistent. In conclusions suggestion for the new research areas on patient-related barriers to cancer pain management are made. Firstly, further research is needed to differentiate the role of cognitive, affective and sensory factors with respect to their impact on pain relief, pain communication and medication adherence. Besides that, validated instruments to assess patients’ pain communication and adherence to analgesic regimen are lacking.

Keywords: Adherence, Adherence, Analgesic Regimen, Attitudes, Barriers, Cancer, Cancer Pain, Cochrane, Communication, Databases, Embase, Experience, Family Caregivers, Guidelines, Hong-Kong, Impact, Literature, Literature Review, Management, Medication, Medication Adherence, Opioids, Pain, Pain Communication, Palliative Care, Patients, Patients Beliefs, Pubmed, Research, Review, Science, Self-Report, Side Effects, Systematic, Web of Science

# Title: Scandinavian Journal of Economics

Full Journal Title: [Scandinavian Journal of Economics](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=sjoe)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Paul, T., Almas, K. and Maktabi, A. (2003), Findlay, Ronald, Jonung, Lars and Lundahl, Mats: Bertil Ohlin-A Centennial Celebration (1899-1999). *Scandinavian Journal of Economics*, **105** (2), 311-316.

Full Text: [2003\Sca J Eco105, 311.pdf](2003/Sca%20J%20Eco105,%20311.pdf)

? Bacchiocchi, E. and Montobbio, F. (2010), International knowledge diffusion and home-bias effect: Do USPTO and EPO patent citations tell the same story?\*. *Scandinavian Journal of Economics*, **112** (3), 441-470.

Full Text: [2010\Sca J Eco112, 441.pdf](2010/Sca%20J%20Eco112,%20441.pdf)

Abstract: This paper estimates the international diffusion of technical knowledge using patent citations. We control for self-citations and for procedural differences between patent offices using equivalent patents. We find that (1) there are clear biases in patent examination processes that generate citations in the two offices, (2) at the EPO there is a strong localization effect at the country level, and the size is comparable to that found at the USPTO, (3) technological fields have different properties of diffusion in the two patent offices that do not depend on a patent office bias, (4) using EPO data, the US is not the leading country in terms of citations made and received, as occurs at the USPTO.

Keywords: Citations, Diffusion, Examiner Citations, Flows, Geography, Growth, Indicators, Innovation, Knowledge, Knowledge Flows, O31, O33, O34, Patent, Patent Citations, Patents, Productivity, Reassessment, Research-and-Development, Self Citations, Self-Citations, Spillovers, Spillovers, US

# Title: Scandinavian Journal of Gastroenterology

Full Journal Title: Scandinavian Journal of Gastroenterology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Xu, T. and Cai, Q.P. (2008), Prophylactic antibiotic treatment in acute necrotizing pancreatitis: Results from a meta-analysis. *Scandinavian Journal of Gastroenterology*, **43** (10), 1249-1258.

Full Text: [2010\Sca J Gas43, 1249.pdf](2010/Sca%20J%20Gas43,%201249.pdf)

Abstract: Objective. The effect of prophylactic antibiotic treatment on infection and survival of acute necrotizing pancreatitis (ANP) remains uncertain. The aim of this study was to assess the long-term efficacy of prophylactic antibiotic treatment for ANP. Material and methods. Searches were carried out of electronic databases including Medline, EMBASE, the Cochrane Controlled Trials Register, the Science Citation Index, and PubMed (updated to December 2007), and manual bibliographical searches were also conducted. A meta-analysis of all randomized controlled trials (RCTs) comparing prophylactic antibiotic treatment with placebo or no treatment was performed. Results. Eight RCTs including 540 patients were assessed. The outcomes included infected necrosis, death, non-pancreatic infection, surgical intervention, and length of hospital stay. Prophylactic antibiotic use leads to a significant reduction of infected necrosis (relative risk (RR) 0.69, 95% CI, 0.50-0.95, p=0.02), non-pancreatic infections (RR 0.66 95% CI, 0.48-0.91, p=0.01), and length of hospital stay (p=0.004) but was not associated with a statistically significant reduction in mortality (RR 0.76 95% CI, 0.50-1.18, p=0.22) and surgical intervention (RR 0.90 95% CI, 0.66-1.23, p=0.52). In a subgroup analysis, carbapenem was associated with a significant reduction in infected necrosis (p=0.009) and non-pancreatic infections (p=0.006), whereas other antibiotics were not. Conclusions. Prophylactic antibiotic treatment is associated with a significant reduction of pancreatic or peripancreatic infection, non-pancreatic infection, and length of hospital stay, but cannot prevent death and surgical intervention in acute necrotizing pancreatitis.

Keywords: Activation Peptides Tap, Acute Necrotizing Pancreatitis, Antibiotic, Antibiotics, Bacterial Translocation, Citation, Controlled Clinical-Trial, Databases, Double-Blind, Imipenem, Intervention, Management, Medline, Meta-Analysis, Methods, Mortality, Multicenter, Outcomes, Peritoneal-Fluid, Placebo, Prophylaxis, Randomized Controlled Trials, Randomized-Trials, Reduction, Risk, Science, Science Citation Index, Septic Complications, Treatment

# Title: Scandinavian Journal of Infectious Diseases

Full Journal Title: Scandinavian Journal of Infectious Diseases

ISO Abbreviated Title: Scand. J. Infect. Dis.

JCR Abbreviated Title: Scand J Infect Dis

ISSN: 0036-5548

Issues/Year: 6

Journal Country Sweden

Language: English

Publisher: Scandinavian University Press

Publisher Address: PO Box 2959 Toyen, Journal Division Customer Service, N-0608 Oslo, Norway

Subject Categories:

Infectious Diseases: Impact Factor

? Kukkula, M., Arstila, P., Klossner, M.L., Maunula, L., Bonsdorff, C.H. and Jaatinen, P. (1997), Waterborne outbreak of viral gastroenteritis. *Scandinavian Journal of Infectious Diseases*, **29** (4), 415-418.

Full Text: [1997\Sca J Inf Dis29, 415.pdf](1997/Sca%20J%20Inf%20Dis29,%20415.pdf)

Abstract: A waterborne epidemic took place in a Finnish municipality in April 1994. Some 1500-3000 people, i.e. 25-50% of the population, had symptomatic acute gastroenteritis. Laboratory findings confirmed adenovirus, a Norwalk-like agent, small round viruses (SRV), and group A and C rotaviruses as causative agents, Norwalk virus being the main cause of the outbreak. The epidemic was most probably associated with contaminated drinking water. The groundwater well, situated in the embankment of a river, was contaminated by polluted river water during the spring flood. A back flow from the river to the well had occurred via a forgotten drainage pipe.

Keywords: Enteric Viruses, PCR, Enteroviruses, Infection

? Zhang, T., Zhao, N.Q., Zhang, T.J., Black, S., Xu, B. and Zhao, G.M. (2008), Meta-analysis of antibiotic susceptibility and the genotype of penicillin-binding proteins in Streptococcus pneumoniae. *Scandinavian Journal of Infectious Diseases*, **40** (10), 797-803.

Full Text: 2008\Sca J Inf Dis40, 797.pdf

Abstract: To further understanding of the mechanisms of development of resistance to penicillin in Streptococcus pneumoniae, and the role of penicillin-binding proteins (PBPs) mutations to antibiotics resistance a meta-analysis was performed. Major databases, PUBMED, Current Contents, Biosis previews, Web of Science, were searched for studies that published within 1997 through to 2007, and reported the penicillin MIC and the alteration of PBP 1a, 2b and 2x (genes or proteins) of clinical S. pneumoniae isolates. Papers were reviewed by 2 persons and used standard criteria to enroll them. Meta-analysis was performed using a random-effects model. Overall, 20 studies were included in the meta-analysis. For the included 1771 clinical S. pneumoniae isolates, the susceptibility to penicillin decreased in inverse proportion to the presence of mutated pbp genes. The mutations of the conserved amino acid motifs STMK and SRNVP of PBP 1A, STMK and LKSG of PBP2X, and SSNT of PBP2B are critical for the penicillin resistance. Those motifs can be used as markers for the penicillin susceptibility of S. pneumoniae. These results are useful in helping define the mechanism of penicillin resistance in S. pneumoniae.

Keywords: 1a, 2b, 2x, Amoxicillin, Antibiotic, Antibiotics, Children, Databases, Development, Genes, Japan, Macrolide Resistance, Mechanism, Meta Analysis, Meta-Analysis, Model, Pneumococci, Resistance, Science, Serotype, Susceptibility, Web of Science

? Tuon, F.F., Higashino, H.R., Lopes, M.I.B.F., Litvoc, M.N., Atomiya, A.N., Antonangelo, L. and Leite, O.M. (2010), Adenosine deaminase and tuberculous meningitis-A systematic review with meta-analysis. *Scandinavian Journal of Infectious Diseases*, **42** (3), 198-207.

Full Text: 2010\Sca J Inf Dis42, 198.pdf

Abstract: Tuberculous meningitis (TBM) is a severe infection of the central nervous system, particularly in developing countries. Prompt diagnosis and treatment are necessary to decrease the high rates of disability and death associated with TBM. The diagnosis is often time and labour intensive; thus, a simple, accurate and rapid diagnostic test is needed. The adenosine deaminase (ADA) activity test is a rapid test that has been used for the diagnosis of the pleural, peritoneal and pericardial forms of tuberculosis. However, the usefulness of ADA in TBM is uncertain. The aim of this study was to evaluate ADA as a diagnostic test for TBM in a systematic review. A systematic search was performed of the medical literature (MEDLINE, LILACS, Web of Science and EMBASE). The ADA values from TBM cases and controls (diagnosed with other types of meningitis) were necessary to calculate the sensitivity and specificity. Out of a total of 522 studies, 13 were included in the meta-analysis (380 patients with TBM). The sensitivity, specificity and diagnostic odds ratios (DOR) were calculated based on arbitrary ADA cut-off values from 1 to 10 U/l. ADA values from 1 to 4 U/l (sensitivity > 93% and specificity < 80%) helped to exclude TBM; values between 4 and 8 U/l were insufficient to confirm or exclude the diagnosis of TBM (p = 0.07), and values > 8 U/l (sensitivity < 59% and specificity > 96%) improved the diagnosis of TBM (p < 0.001). None of the cut-off values could be used to discriminate between TBM and bacterial meningitis. In conclusion, ADA cannot distinguish between bacterial meningitis and TBM, but using ranges of ADA values could be important to improve TBM diagnosis, particularly after bacterial meningitis has been ruled out. The different methods used to measure ADA and the heterogeneity of data do not allow standardization of this test as a routine.

Keywords: Adults, Bacterial Meningitis, Cairo, Cerebrospinal-Fluid, Children, Csf, Developing Countries, Diagnosis, Diagnostic Test, Diagnostic-Value, Disability, Effusions, Egypt, Embase, Features, Infection, Literature, Medical, Medline, Meta-Analysis, Patients, Pericarditis, Review, Science, Sensitivity, Sensitivity and Specificity, Specificity, Systematic, Systematic Review, Treatment, Tuberculosis, Web of Science

? Huang, T.C., Wang, H.Q., Jing, J.Y., Jin, J.F. and Cui, W. (2011), Association between lymphotoxin-alpha intron +252 polymorphism and sepsis: A meta-analysis. *Scandinavian Journal of Infectious Diseases*, **43** (6-7), 436-447.

Full Text: 2011\Sca J Inf Dis43, 436.pdf

Abstract: Background: We evaluated the association of lymphotoxin-alpha (LTA, also known as tumour necrosis factor-beta) promoter +252 A/G polymorphism with sepsis. Methods: A systematic search was performed in MEDLINE, EMBASE, and Web of Science (for the period January 1966 to June 2010). Two reviewers independently selected studies on the genetic association of LTA +252 A/G polymorphism with sepsis and independently extracted data onto standardized forms. Results: Twenty-seven studies with 4399 septic patients were included based on predefined inclusion criteria. As compared to AG + GG, the LTA AA genotype was significantly associated with an increased development of sepsis in the overall population (odds ratio (OR) 1.33, 95% confidence interval (CI) 1.09-1.62; p = 0.006). An association between mortality from sepsis and AA genotype was also found in the overall population (OR 1.89, 95% CI 1.27-2.80; p = 0.002). Stratification by ethnicity indicated that the contribution to both sepsis susceptibility and mortality may be stronger in Caucasians (OR 1.44, 95% CI 1.08-1.91 and OR 2.47, 95% CI 1.52-4.00, respectively) than in other ethnicities. Conclusions: The LTA +252 A/G polymorphism is associated with both susceptibility to and mortality from sepsis.

Keywords: Community-Acquired Pneumonia, Contribution, Critically-Ill Patients, Development, Embase, Ethnicity, Factor Gene Polymorphisms, Genetic, Genotypic Differences, Interleukin-6 Blood-Levels, Lymphotoxin-Alpha, Medline, Meta-Analysis, Methods, Mortality, Patients, Polymorphism, Ratio, Science, Sepsis, Septic Shock, Stratification, Susceptibility, Systematic, Tnf-Beta, Trauma Patients, Tumor-Necrosis-Factor, Web of Science

# Title: Scandinavian Journal of Management

Full Journal Title: [Scandinavian Journal of Management](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=09565221)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0036-5564

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Engwall, L. (1996), The Vikings versus the world: An examination of Nordic business research. *Scandinavian Journal of Management*. **12** (4), 425-436.

Full Text: [S\Sca J Man12, 425.pdf](S/Sca%20J%20Man12,%20425.pdf)

Abstract: This paper presents the results of an analysis of the articles published by Nordic management scholars in the 15 most important business research journals during the period 1981-1992. The analysis shows that the predominance of North American scholars in these journals is massive. However, although Nordic management researchers account for only about 1% of all the authorships, they constitute an important minority in the field. These Northerners are more successful in the European journals and tend to focus mainly on accounting and organizational problems. Their frame of reference is heavily influenced by the Carnegie-Tech tradition, that is the works of Richard M. Cyert, James G. March and Herbert A. Simon. This means that their publication behaviour in international journals is rather similar to that which appears in the *Scandinavian Journal of Management*.

Keywords: Bibliometrics, Management Research, Nordic Countries

? Macdonald, S. and Kam, J. (2010), Counting footnotes: Citability in management studies. *Scandinavian Journal of Management*, **26** (2), 189-203.

Full Text: [2010\Sca J Man26, 189.pdf](2010/Sca%20J%20Man26,%20189.pdf)

Abstract: The primary purpose of academic citation, at least in Management Studies, is citation analysis’. So much hangs on citation analysis as an indicator of academic performance - careers, funding, institutional survival - that papers are written as platforms for citation rather than to be read. To satisfy the requirements of referees, editors, and publishers, a paper must be, above all else, citable. This paper investigates the citation practices of some of the top authors of some of the top papers in some of the top journals of Management Studies. It finds citation by an elite of an elite for an elite. This is generally seen as evidence of the disciplinary strength of Management Studies. We interpret the evidence differently, we see convergence on papers that are citable. We consider what makes a paper citable. Most important of all is that the paper is cited by others. (C) 2010 Published by Elsevier Ltd.

Keywords: Bias, Careers, Citation, Citation Analysis, Convergence, Elsevier, Evolution, Funding, Impact Factor, Journals, Jun, Management, Management Studies, Performance, Prestige, Primary, Publication, Quality Journals, Research Assessment Exercise, Scholarly Communication, Science-Citation-Index, Scientific Papers

# Title: Scandinavian Journal of Medicine & Science in Sports

Full Journal Title: Scandinavian Journal of Medicine & Science in Sports

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rehn, B., Lidstrom, J., Skoglund, J. and Lindstrom, B. (2007), Effects on leg muscular performance from whole-body vibration exercise: A systematic review. *Scandinavian Journal of Medicine & Science in Sports*, **17** (1), 2-11.

Abstract: The purpose of this study was to investigate the effects on leg muscular performance from whole-body vibration exercise. Literature search was performed on the databases PUBMED, Cinahl, ISI Web of Science (Sci-expanded, SSCI) and EMBASE (Rehab & Physical Med). Rating of 19 relevant studies was performed (14 on long-term exercise and five on short-term exercise) using a score system for the methodological quality. Several randomized-controlled trial studies of high to moderate quality show similar improvements from long-term regimen on muscular performance in the legs after a period of whole-body vibration exercise. As there were few studies on short-term exercise and as they had no control groups, the same convincing improvements regarding muscular performance were not achieved. Preliminarily, there is strong to moderate evidence that long-term whole-body vibration exercise can have positive effects on the leg muscular performance among untrained people and elderly women. There is no clear evidence for effects on muscular performance after short-term vibration stimuli.

Keywords: Back-Pain, Balance, Control, Control Groups, Cross-Over, Databases, Elderly, Exercise, Extension, ISI, Literature, Muscle Strength, Postmenopausal Women, Power, Randomized Controlled Trial, Randomized Controlled-Trials, Responses, Review, Science, Skeletal-Muscle, Ssci, Strength, Systematic, Systematic Review, Vertical Jump, Vibration, Vibration Exercise, Vibration Training, Web of Science, Whole-Body Vibration, Women

# Title: Scandinavian Journal of Primary Health Care

Full Journal Title: [Scandinavian Journal of Primary Health Care](http://weblinks3.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+pbhjnh+bt+ID++%22BDB%22+7B90&_ug=sid+6E57C7B4%2D4F04%2D4AB5%2D8099%2DE7A3C5E5BBDA%40sessionmgr2+dbs+pbh+9397&_us=hd+True+sm+ES+4DBA&_uso=st%5B0+%2DID++BDB+tg%5B0+%2D+db%5B0+%2Dpbh+op%5B0+%2D), [Scandinavian Journal of Primary Health Care](http://www.tandf.co.uk/journals/titles/02813432.asp)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kragstrup, J. (2001), Increasing impact of the *Scandinavian Journal of Primary Health Care* (SJPHC). *Scandinavian Journal of Primary Health Care*, **19** (2), 65-66.

Full Text: [S\Sca J Pri Hea Car19, 65.pdf](S/Sca%20J%20Pri%20Hea%20Car19,%2065.pdf)

? Ovhed, I., Van Royen, P. and Hakansson, A. (2005), What is the future of primary care research? Probably fairly bright, if we may believe the historical development. *Scandinavian Journal of Primary Health Care*, **23** (4), 248-253.

Full Text: [2005\Sca J Pri Hea Car23, 248.pdf](2005/Sca%20J%20Pri%20Hea%20Car23,%20248.pdf)

Abstract: Objective. To study one aspect of the development of primary care research from 1975 to 2003. Design. Quantitative bibliometric study. Setting. Pub Med database. Subjects. Four Nordic countries (Denmark, Finland, Norway, and Sweden), seven countries from the rest of Europe (Belgium, France, Germany, Italy, the Netherlands, Spain, and the UK), and seven countries from the rest of the world (Australia, Canada, India, Japan, New Zealand, South Africa, and the USA). Main outcome measures. Number of primary healthcare publications per million inhabitants. Percentage of publications in primary healthcare of all publications in human medicine. Results. In 2003, New Zealand, the UK, and Australia were in the lead, with barely 20 primary care publications per million inhabitants, followed by Norway, Sweden, the Netherlands, and Denmark, where the corresponding figure was around 10. A vigorous increase in publications from 1975 to 2003 was clearly seen in most of the countries. However, during the same period the proportion of publications from primary care in relation to all publications in human medicine was only moderately increased, or virtually unchanged. Conclusion. It is believed that primary care research has a future, and it is hoped it may even be bright. However, searching Pub Med gave but one aspect of the historical development, and in particular the comparisons between countries may be questionable.

Keywords: Africa, Australia, Belgium, Bibliometric, Bibliometric Study, Canada, Care, Database, Denmark, Development, Europe, Family Medicine, Finland, France, General Practice, General-Practice, Germany, Healthcare, Human, India, Italy, Japan, Lead, Medicine, Netherlands, New Zealand, Norway, Outcome, Outcome Measures, Primary, Primary Care, Primary Health Care, PUB MED, Publications, Research, South Africa, Spain, Sweden, The Netherlands, UK, USA, World

? Thulesius, H. (2011), Assessing research impact with Google Scholar: The most cited articles in the journal 2008-2010. *Scandinavian Journal of Primary Health Care*, **29** (4), 193-195.

Full Text: [2011\Sca J Pri Hea Car29, 193.pdf](2011/Sca%20J%20Pri%20Hea%20Car29,%20193.pdf)

Keywords: Education, Elderly-Patients, General-Practice, Google Scholar, Impact, Inappropriate Prescriptions, Journal, Research, Research Impact, Science, Scopus, Sickness Certification, Web

# Title: Scandinavian Journal of Psychology

Full Journal Title: [Scandinavian Journal of Psychology](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=sjop)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0036-5564

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Olsson, H. (1999), Is there a Scandinavian psychology? A bibliometric note on the publication profiles of Denmark, Finland, Norway, and Sweden. *Scandinavian Journal of Psychology*, **40** (4), 235-239.

Full Text: [S\Sca J Psy40, 235.pdf](S/Sca%20J%20Psy40,%20235.pdf)

Abstract: This note presents a quantitative bibliometric analysis based on information obtained from the PsycINFO database concerning publication patterns in different subfields of Scandinavian psychology for the years 1984 to 1997. A cluster analysis shows that the publication profiles of the Scandinavian countries are more similar to each other than to both the profile of the USA and a norm profile based on all countries except the USA and Scandinavia. The main differences are that the relative proportions of articles dealing with psychological disorders are higher and the relative proportions of articles dealing with educational psychology are lower for Scandinavia than for the rest of the world. Within the Scandinavian countries, Finland and Sweden form one cluster with higher relative proportions of psychophysiological articles, and Denmark and Norway form one cluster with higher relative proportions of articles dealing with psychological disorders.

Keywords: Scandinavian Psychology, Publication Profiles, Bibliometric Studies

Hjørland, B. (2002), Review. *Scandinavian Journal of Psychology*, **43** (1), 93-96.

Full Text: [S\Sca J Psy43, 93.pdf](S/Sca%20J%20Psy43,%2093.pdf)

# Title: Scandinavian Journal of Public Health

Full Journal Title: Scandinavian Journal of Public Health

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Arntzen, A. and Andersen, A.M.N. (2004), Social determinants for infant mortality in the Nordic countries, 1980-2001. *Scandinavian Journal of Public Health*, **32** (5), 381-389.

Abstract: Aim: Social equity in health is an important goal of public health policies in the Nordic countries. Infant mortality is often used as an indicator of the health of societies, and has decreased substantially in the Nordic welfare states over the past 20 years. To identify social patterns in infant mortality in this context the authors set out to review the existing epidemiological literature on associations between social indicators and infant mortality in Denmark, Finland, Norway, and Sweden during the period 1980-2000. Methods: Nordic epidemiological studies in the databases ISI Web of Science, PUBMED, and OVID, published between 1980 and 2000 focusing on social indicators of infant, neonatal, and postneonatal mortality, were identified. The selected keywords on social indicators were: education, income, occupation, social factors, socioeconomic status, social position, and social class. Results: Social inequality in infant mortality was reported from Denmark, Finland, Norway, and Sweden, and it was found that these increased during the study period. Post-neonatal mortality showed a stronger association with social indicators than neonatal mortality. Some studies showed that neonatal mortality was associated with social indicators in a non-linear fashion, with high rates of mortality in both the lowest and highest social strata. The pattern differed, however, between countries with Finland and Sweden showing consistently less social inequalities than Denmark and Norway. While the increased inequality shown in most studies was an increase in relative risk, a single study from Denmark demonstrated an absolute increase in infant mortality among children born to less educated women. Conclusions: Social inequalities in infant mortality are observed in all four countries, irrespective of social indicators used in the studies. It is, however, difficult to draw inferences from the comparisons between countries, since different measures of social position and different inclusion criteria are used in the studies. Nordic collaborative analyses of social gradients in infant death are needed, taking advantage of the population-covering registers in longitudinal designs, to explore the mechanisms behind the social patterns in infant mortality.

Keywords: Authors, Birth-Weight, Children, Databases, Death, Determinants, Education, Epidemiology, Finland, Health, Income, Inequalities, Infant Mortality, ISI, Isi Web of Science, Literature, Maternal Education, Methods, Mortality, Nordic Countries, Occupation, Policies, Pregnancy, Public Health, Pubmed, Relative Risk, Review, Risk, Science, Social, Social Class, Social Inequality, Socioeconomic Status, Socioeconomic-Factors, Stillbirth, Sweden, Web of Science, Women

? Niclasen, B.V.L. and Bjerregaard, P. (2007), Child health in Greenland. *Scandinavian Journal of Public Health*, **35** (3), 313-322.

Abstract: Aim: To review the knowledge on child health and child health problems in Greenland. Method: The review was based on theses, national statistics, national and international reports, and a search in Pub Med, PsycINFO, Web of Science, and WHOLIB databases from 1985 to 2005. The resulting articles were sorted by topic, type, quality of study, and relevance for child health today, providing 47 articles. Results: Children in Greenland have become taller and have improved their general health. The morbidity found in Greenlandic children is similar to that found elsewhere even though the magnitude of problems might differ. The child mortality is relatively high and unevenly distributed. The acute disease pattern is dominated by infections, mostly airway infections. Otitis and its sequelae is a problem. An increase in chronic conditions such as atopy, asthma, obesity, and disabilities has taken place. Overweight and obesity have tripled in 20 years and are a health threat as well as constituting negative health behaviour. Social ill health, socioeconomic inequity, and sociocultural changes also influence health but their consequences are not well investigated in children. Conclusions: A relatively high child mortality but the same morbidity pattern as in other Western societies was found. Negative health behaviour is frequent in schoolchildren. The influence of rapid cultural changes, and familial and societal factors related to social ill health, together with socioeconomic inequity, are of major importance to the health of children in Greenland. More accurate data on child health are necessary in the future to secure better prioritization. It is suggested to construct a set of reliable indicators of child health in Greenland to monitor the health of children on a national and regional basis.

Keywords: Acute, Adolescents, Airway, Asthma, Child, Child Health, Children, Databases, Disease, Disease Pattern, Greenland, Health Behaviour, Inequity, Inuit, Knowledge, Morbidity, Mortality, Obesity, Pub Med, Review, Science, Social, Social Ill-Health, Statistics, Web of Science

# Title: Scandinavian Journal of Rheumatology

Full Journal Title: Scandinavian Journal of Rheumatology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Kristensen, L.E., Jakobsen, A.K., Bartels, E.M., Geborek, P., Bliddal, H., Saxne, T., nneskiold-Samsoe, B. and Christensen, R. (2011), The number needed to treat for second-generation biologics when treating established rheumatoid arthritis: A systematic quantitative review of randomized controlled trials. *Scandinavian Journal of Rheumatology*, **40** (1), 1-7.

Abstract: Objective: To evaluate the number needed to treat (NNT) and the number needed to harm (NNH) of the second-generation biologics abatacept, certolizumab, golimumab, rituximab, and tocilizumab in patients with established rheumatoid arthritis (RA) taking concomitant methotrexate (MTX). Methods: A systematic literature search of MEDLINE, EMBASE, Web of Science, and the Cochrane Register of Controlled Trials was conducted up to 1 November 2009. We selected any published randomized, double-blind, MTX-controlled study including RA patients with a mean disease duration of at least 5 years before entering a pivotal trial on second-generation biological therapy. Studies eligible for inclusion involved patients, who had previously shown inadequate response to conventional disease-modifying anti-rheumatic drug (DMARD) therapy. Pre-specified binary outcomes were extracted with a preference for 1-year data (6-month data were used if no data were available for 1 year). Two reviewers independently extracted the data necessary to estimate the absolute measures in a non-responder intention-to-treat OM analysis. Results: Five randomized controlled trials, one for each of the drugs, were selected and data extracted according to published data at endpoint for American College of Rheumatology 50% (ACR50)-responding patients, and withdrawals due to adverse events. NNT ranged from four to six treated patients to achieve one ACR50 response, while withdrawals due to adverse events were few and non-significant compared to the placebo group, except for rituximab administered as 1000 mg. Conclusion: Comparable efficacy was shown by the five biological agents studied, with few adverse events. However, for rituximab, tocilizumab, and golimumab, only 6-month data were available, hampering the external validity with regard to long-term efficacy and tolerability. A low dose (500 mg) of rituximab may be as effective as the recommended dose of 1000 mg.

Keywords: Analysis, Arthritis, Clinical-Practice, Cochrane, Costimulation Modulator Abatacept, Disease, Disease-Activity, Double-Blind, Drug, Drugs, Efficacy, Embase, Inadequate Response, Interleukin-6 Receptor Inhibition, Literature, Medline, Methods, Methotrexate, Modifying Antirheumatic Drugs, Nonresponder, Outcomes, Patients, Phase-III, Quantitative, Randomized Controlled Trials, Review, Science, Systematic, Therapy, Validity, Web of Science

# Title: Scandinavian Journal of Social Medicine

Full Journal Title: Scandinavian Journal of Social Medicine

ISO Abbreviated Title: Scand. J. Soc. Med.

JCR Abbreviated Title: Scand J Soc Med

ISSN: 0300-8037

Issues/Year: 4

Journal Country Sweden

Language: English

Publisher: Scandinavian University Press

Publisher Address: PO Box 2959 Toyen, Journal Division Customer Service, N-0608 Oslo, Norway

Subject Categories:

Public, Environmental & Occupational Health: Impact Factor 0.632, 65/85

? Hornquist, J.O. and Hansson, B. (1991), Long-term sick-listing, medical rehabilitation and life quality change: A patient-evaluation. *Scandinavian Journal of Social Medicine*, **19** (2), 99-104.

Full Text: Sca J Soc Med19, 99.pdf

Abstract: This evaluation of the health service at one of the hospitals of the National Insurance Board in Sweden is primarily based on the perspective of the patient. One interview group of 32 patients (I-group) made life quality ratings before-after their hospital stay. In responding to a postal questionnaire one year after discharge from hospital, another group of 93 former patients (Q-group) made parallel self-ratings. Due to prolonged sick-listing, the patients had been admitted to the hospital for rehabilitation/examination according to paragraph 2: 11 in the general insurance law. The basis for their sick-listing was hereby critically reviewed. Within the framework of additional examinations (interview and structured general questions), more than 40% of the respondents stated that the hospital stay was mainly satisfying and a great majority appreciated the nursing care. However, the self-ratings showed that the patients did not ascribe any particularly great significance to the hospital stay. In the short term, it even seemed to have a certain negative impact on the life quality of the patients. No obvious positive bias seems to be built into the ratings. Thus, the assessment package applied may also work well in similar evaluative settings.

Keywords: Evaluation, Quality of Life, Rehabilitation

? Käsmä Ronkainen, L. and Virokannas, H. (1996), Concern about the environment among medical students. *Scandinavian Journal of Social Medicine*, **24** (2), 121-123.

Full Text: Sca J Soc Med24, 121.pdf

Abstract: The aim of this study was to survey concern about the environment among medical students in Oulu in northern Finland. A questionnaire was filled in by 181 (74%) students. Most of the students were very concerned about the environment. Over half of the students were very concerned about water pollution and destruction of the rain forests. Female gender, membership in any environmental organisations and a good knowledge about the health effects of environmental factors were found to be significant independent factors to increase the concern.

Keywords: Environmental Activity, Environmental Attitudes

# Title: Scandinavian Journal of Social Welfare

Full Journal Title: Scandinavian Journal of Social Welfare

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Ioka, B. (1996), Lessons on community social services from the great Hanshin earthquake. *Scandinavian Journal of Social Welfare*, **5** (3), 125-129.

Full Text: [1996\Sca J Soc Wel5, 125.pdf](1996/Sca%20J%20Soc%20Wel5,%20125.pdf)

Abstract: This article describes crucial lessons learned on community social services from the great Hanshin earthquake, including negative and positive aspects. The Hanshin quake brought about the biggest urban disaster Japan has experienced since the Second World War. The character of the disaster problems and response measures differed from the emergency stage (in the aftermath of the quake) to the relief stage (roughly until the end of March 1995) and the restoration and reconstruction stage (thereafter).

# Title: Scandinavian Journal of Statistics

Full Journal Title: [Scandinavian Journal of Statistics](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-9469/issues)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Beirlant, J. and Einmahl, J.H.J. (2010), Asymptotics for the Hirsch Index. *Scandinavian Journal of Statistics*, **37** (3), 355-364.

Full Text: [2010\Sca J Sta37, 355.pdf](2010/Sca%20J%20Sta37,%20355.pdf)

Abstract: The last decade methods for quantifying the research output of individual researchers have become quite popular in academic policy making. The h-index (or Hirsch index) constitutes an interesting combined bibliometric volume/impact indicator that has attracted a lot of attention recently. It is now a common indicator, available for instance on the Web of Science. In this article, we establish the asymptotic normality of the empirical h-index. The rate of convergence is non-standard: root h/(1 + nf(h)), where f is the density of the citation distribution and n is the number of publications of a researcher. In case that the citations follow a Pareto-type respectively a Weibull-type distribution as defined in extreme value theory, our general result specializes well to results that are useful for practical purposes such as the construction of confidence intervals and pairwise comparisons for the h-index. A simulation study for the Pareto-type case shows that the asymptotic theory works well for moderate sample sizes already.

Keywords: Asymptotic Normality, Bibliometric, Citation Counts, Extreme Value Theory, h Index, h-Index, Hirsch Index, Research, Research Output, Tail Empirical Process, Weibull Tail-Coefficient

# Title: Scandinavian Journal of Work Environment & Health

Full Journal Title: Scandinavian Journal of Work Environment & Health

ISO Abbreviated Title: Scand. J. Work Environ. Health

JCR Abbreviated Title: Scand J Work Env Hea

ISSN: 0355-3140

Issues/Year: 6

Journal Country/Territory: Finland

Language: English

Publisher: Scand J Work Env Health

Publisher Address: Topeliuksenkatu 41A, SF-00250 Helsinki, Finland

Subject Categories:

Public, Environmental & Occupational Health: Impact Factor 1.756, 25/85

Wen, C.P. and Tsai, S.P. (1984), A review of methodological issues of the standardized mortality ratio in occupational epidemiology. *Scandinavian Journal of Work Environment & Health*, **10** (2), 124.

Full Text: [S\Sca J Wor EnvHea10, 124.pdf](S/Sca%20J%20Wor%20EnvHea10,%20124.pdf)

? Harada, N. (1987), Esthesiometry, nail compression and other function tests used in Japan for evaluating the hand-arm vibration syndrome. *Scandinavian Journal of Work Environment & Health*, **13** (4), 330-333.

Full Text: [1987\Sca J Wor EnvHea13, 330.pdf](1987/Sca%20J%20Wor%20EnvHea13,%20330.pdf)

Abstract: Various function tests are performed on the upper extremities of patients in Japan as part of a systematic method for diagnosing the hand-arm vibration syndrome. Although the observations are not confined to the hands and arms, but include the whole body, the evaluation of the syndrome is essentially based on the severity of Raynaud’s phenomenon and the findings of the function tests. With the function tests, including a cold provocation test with 10°C water, the efficiency of discrimination between workers with vibration-induced white finger and reference workers was investigated. The results indicated that the function tests were of diagnostic significance for the hand-arm vibration syndrome. The influences of ageing, atmospheric temperature in the test room, seasonal variation in temperature, and reproducibility were investigated to clarify some points. The equipment and techniques have been basically standardized. However, for comparing and analyzing the results of the function tests performed in different research institutes, further investigation of the standardization of the test and evaluation methods is necessary.

? Matsumoto, T. (1987), Tests employed in Japan for the investigation of peripheral circulatory disturbances due to hand-arm vibration exposure. *Scandinavian Journal of Work Environment & Health*, **13** (4), 356-357.

Full Text: [1987\Sca J Wor EnvHea13, 356.pdf](1987/Sca%20J%20Wor%20EnvHea13,%20356.pdf)

Abstract: Tests for the investigation of peripheral circulatory function are thought, in Japan, to be of primary importance for the proper diagnosis of the hand-arm vibration syndrome. The complaints presented in connection with Raynaud’s phenomenon (finger skin blanching, numbness, cold sensation, and pain in the hands) should be thoroughly assessed. In evaluating the results of skin temperature measurements and the nail compression test before and after cold provocation by immersion of the hands in cold water, seasonal and diurnal variation, as well as differences in room temperature, temperature of the cooling water, duration of cooling time, etc, must be taken into account.

? Rylander, R., Bonevik, H. and Rubenowitz, E. (1991), Magnesium and calcium in drinking-water and cardiovascular mortality. *Scandinavian Journal of Work Environment & Health*, **17** (2), 91-94.

Full Text: [1991\Sca J Wor EnvHea17, 91.pdf](1991/Sca%20J%20Wor%20EnvHea17,%2091.pdf)

Abstract: Data on the hardness of drinking water were collected from 27 municipalities in Sweden where the drinking water quality had remained unchanged for more than 20 years. Analyses were made of the levels of lead, cadmium, calcium, and magnesium. These water-quality data were compared with the age-adjusted mortality rate from ischemic heart and cerebrovascular disease for the period 1969-1978. Lead and cadmium were not present in detectable amounts except in one water sample. A statistically significant inverse relationship was present between hardness and mortality from cardiovascular disease for both sexes. Mortality caused by ischemic heart disease was inversely related to the magnesium content, particularly for the men (P < 0.01). The rather small set of data supports results from previous studies suggesting that a high magnesium level in drinking water reduces the risk for death from ischemic heart disease, especially among men, although the possible importance of confounding factors needs further evaluation.

Keywords: Cerebrovascular Disease, Ischemic Heart Disease, Magnesium, Water Hardness, Schemic-Heart-Disease, Hardness, Deficiency, Death

? Kurozawa, Y., Nasu, Y. and Nose, T. (1991), Diagnostic value of finger systolic blood pressure in the assessment of vasospastic reactions in the finger skin of vibration-exposed subjects after finger and body cooling. *Scandinavian Journal of Work Environment & Health*, **17** (3), 184-189.

Full Text: [1991\Sca J Wor EnvHea17, 184.pdf](1991/Sca%20J%20Wor%20EnvHea17,%20184.pdf)

Abstract: To assess the severity of vibration-induced white finger (VWF), finger systolic blood pressure (FSBP) after finger cooling and after combined finger and body cooling was measured by strain-guage plethysmography for 100 vibration-exposed men and 22 healthy men. The exposed men were classified as being without VWF (EW), with mild VWF (EM), and with severe VWF (ES) according to records of blanching attacks. FSBP was significantly reduced only in the ES group after finger cooling and in the ES and EM groups after both body and finger cooling. The diagnostic sensitivity and specificity for VWF was 81.7 and 90.3%, respectively. Skin temperature measurements before and after immersion in cold water (5°C, for 10 min) could not be used for the estimation of VWF severity.

? Jäppinen, P. and Pukkala, E. (1991), Cancer incidence among pulp and paper workers exposed to organic chlorinated compounds formed during chlorine pulp bleaching. *Scandinavian Journal of Work Environment & Health*, **17** (5), 356-359.

Full Text: [1991\Sca J Wor EnvHea17, 356.pdf](1991/Sca%20J%20Wor%20EnvHea17,%20356.pdf)

Abstract: The risk of cancer of 152 male workers exposed to organic chlorine compounds formed during chlorine pulp bleaching was assessed in a retrospective cohort study. The men had worked continuously for at least one year in selected job categories between 1 January 1945 and 31 December 1961. The cohort was followed for death and cancer incidence until 31 December 1987 with the use of the data of the National Population Register and the Finnish Cancer Registry. There were 12 observed cancers against 8.1 expected [standardized incidence ratio (SIR) 1.5, 95 % confidence interval (95 % CI) 0.8-2.6]. Among the stock preparation workers (N = 53), a significantly elevated risk of lung cancer was found (6 observed, 1.0 expected, SIR 6.3, 95 % CI 2.3-14) that was especially prominent after a latency (time since first employment) of at least 15 years and in the age group of 35 to 59 years. Although all of the cases involved smokers, a part of the increased incidence may be associated with the workplace exposure to organic chlorinated compounds.

Keywords: Lung-Cancer, New-Hampshire, Mortality, Occupation, Health, Ratio, Cohort Study, Dioxin, Lung Cancer

Burdorf, A. (1992), Exposure assessment of risk-factors for disorders of the back in occupational epidemiology. *Scandinavian Journal of Work Environment & Health*, **18** (1), 1-9.

Full Text: [S\Sca J Wor EnvHea18, 1.pdf](S/Sca%20J%20Wor%20EnvHea18,%201.pdf)

Abstract: This review describes methods for assessing exposure to postural load of the back in occupational epidemiologic studies. Eighty-one original articles were selected that presented information on the prevalence of back disorders in occupational groups. In 47 (58%) of these studies no data on exposure to risk factors were given. In the remaining 34 studies (42%) exposure assessment was performed by questionnaire (33%), observation (9%), and direct measurement (5%). Measures of exposure were predominantly presented at the nominal and ordinal levels. It is argued that in most epidemiologic studies on disorders of the back in occupational groups the quality of exposure data is poor. Quantitative measurement methods need to be developed for application in occupational epidemiology.

Keywords: Measurement, Postural Load, Questionnaire, Reliability, Review, Whole-Body Vibration, Concrete Reinforcement Workers, Patient Transfer Activities, Lumbar Intervertebral-Disk, Musculoskeletal Disorders, Tractor Drivers, House Painters, Individual Occupations, Professional Drivers, Working-Conditions

Axelson, O. (1994), Some recent developments in occupational epidemiology. *Scandinavian Journal of Work Environment & Health*, **20**, 9-18.

Full Text: [S\Sca J Wor EnvHea20, 9.pdf](S/Sca%20J%20Wor%20EnvHea20,%209.pdf)

Abstract: Occupational epidemiology has grown rapidly since the late 1970s. Case-referent studies have become popular, but more recent development relates to analyses of cohort data. Length of follow-up and employment status can now be adjusted for in such analyses. Attention should also be given to ‘time windows’ of relevant exposure, not only in cancer studies. In cross-sectional studies of common diseases, the prevalence rate ratio should be used rather than the currently popular but unintelligible odds ratio as obtained by logistic regression. Exposure assessment should involve measures that would best reveal an existing risk and dose-response relationships. New achievements in molecular biology are currently influencing the development in occupational epidemiology. Not only DNA (or protein) adducts as markers of exposure or early effect, but also the possibilities to use data on metabolic polymorphism to identify genetically susceptible individuals attract interest. Activated oncogenes and inactivated tumor suppressor genes are useful for subspecifying various cancer types so as to obtain more sensitive studies.

Keywords: Cohort, Confounding, Cross-Sectional, Ethics, Exposure, Molecular Biology, Mutation, Oncogene, Review, Time Window, Acute Myeloid-Leukemia, Job-Exposure Matrices, Time-Related Factors, Electromagnetic-Fields, Lung-Cancer, Molecular Epidemiology, Parkinsons-Disease, Bladder-Cancer, P53 Gene, Cohort

Kauppinen, T.P. (1994), Assessment of exposure in occupational epidemiology. *Scandinavian Journal of Work Environment & Health*, **20**, 19-29.

Full Text: [S\Sca J Wor EnvHea20, 19.pdf](S/Sca%20J%20Wor%20EnvHea20,%2019.pdf)

Abstract: Recent progress in assessing exposure in occupational epidemiology studies is reviewed. Traditional methods based on surrogate and qualitative measures of exposure are no longer sufficient for searching for new risks, quantifying risks, and learning about their mechanisms. More sophisticated methods and exposure indices are needed that are aimed at estimating the exposure-response relation. Prospective studies, case-referent studies within cohorts, and community-based case-referent studies applying interviews of the subjects or confirming exposures from work-places are designs favoring exposure assessment. Exposure modeling is expected to improve the quality of estimates in industry-based studies. Job-exposure matrices have proved useful, especially in analyses of large studies, provided that they are applied so that misclassification does not significantly bias the results. Misclassification of exposure should be regularly assessed and controlled in epidemiologic studies. Good documentation of the information used and studies on methodological validity and reliability are needed to develop exposure assessment.

Keywords: Dose-Response, Exposure Index, Exposure-Response, Job-Exposure Matrix, Misclassification, Model, Retrospective, Review, Historical Exposure, Air Contaminants, Chemical-Agents, Past Exposure, Relative Risk, Misclassification, Job, Cancer, Matrices, Bias

? Smit, H.A., van Rijssen, A., Vandenbroucke, J.P. and Coenraads, P.J. (1994), Susceptibility to and incidence of hand dermatitis in a cohort of apprentice hairdressers and nurses. *Scandinavian Journal of Work Environment & Health*, **20** (2), 113-121.

Full Text: [1994\Sca J Wor Env Hea20, 113.pdf](1994/Sca%20J%20Wor%20Env%20Hea20,%20113.pdf)

Abstract: OBJECTIVES--The role of atopic constitution, contact sensitization, transepidermal water loss, and dry skin in the development of hand dermatitis was investigated in a prospective study of 74 apprentice hairdressers and 111 apprentice nurses.

METHODS--Base-line measurements included a questionnaire on personal characteristics and anamnestic information, examination of hand skin, measurements of transepidermal water loss, patch tests, and prick tests. The condition of the hands, previous exposure, and transepidermal water loss were followed at intervals of four to six weeks. Cox proportional hazard models were used in the statistical analysis.

RESULTS--The average incidence rate of hand dermatitis was 32.8 cases per 100 person-years for the hairdressers and 14.5 cases per 100 person-years for the nurses. The rate ratio of having a dry versus normal skin type was 7.3 for the hairdressers [95% confidence interval (95% CI) 2.2-24.3] and 1.7 for the nurses (95% CI 0.5-6.4). Apprentice nurses with a history of (atopic) mucosal symptoms had a 3.4-fold increased incidence rate of hand dermatitis (95% CI 1.05-11.2). The rate ratio of mucosal atopy for the apprentice hairdressers was 2.2 (95% CI 0.7-6.7). Graphic display of the results suggested an increased risk of hand dermatitis among the apprentice hairdressers with transepidermal water loss on the hand greater than 15 g.m-2.h, but the relative risk of increased transepidermal water loss was not statistically significant.

CONCLUSION--The most important endogenous risk factors for hand dermatitis among the apprentice hairdressers and nurses were the presence of dry skin and a history of mucosal atopy. No relationship between increased transepidermal water loss and the risk of hand dermatitis was observed.

? Rahman, M., Wingren, G. and Axelson, O. (1996), Diabetes mellitus among Swedish art glass workers: An effect of arsenic exposure? *Scandinavian Journal of Work Environment & Health*, **22** (2), 146-149.

Full Text: [1996\Sca J Wor Env Hea22, 146.pdf](1996/Sca%20J%20Wor%20Env%20Hea22,%20146.pdf)

Abstract: Objectives The purpose of this study was to search for evidence of an association between occupational arsenic exposure and diabetes mellitus, as implied by the relation of this disease to arsenic in drinking water in a recent study from Taiwan.

Methods A case-referent analysis on death records of 5498 individuals in the art glass producing part of southeastern Sweden was performed. Out of all the enrolled subjects, 888 were glass workers. According to occupational title, glassblowers, foundry workers, and unspecified workers were regarded as potentially exposed to arsenic. Persons with a diagnosis of diabetes mellitus either as an underlying or contributing cause of death were considered cases. Referents were decedents without any indication of cancer, cardiovascular disease, or diabetes.

Results A slightly elevated risk [Mantel-Haenszel odds ratio (MH-OR) 1.2, 95% confidence interval(95% CI) 0.82-1.8] was found for diabetes mellitus among the glassworks employers, especially in combination with cardiovascular disease (MH-OR 1.4, 95% CI 0.81-2.3). For the glassblowers, other foundry workers and unspecified glassworkers probably exposed to arsenic, the M-H odds ratio was 1.4 (95% CI 0.92-2.2). Unspecified glass workers, who probably included persons with high exposure, carried the higher risk (MH-OR 1.8, 95% CI 1.1-2.8).

Conclusions The observations from this study provide limited support for the possibility that occupational arsenic exposure could play a role in the development of diabetes mellitus. Many other metallic compounds are also used in art glass production, however, and there is a possibility of confounding.

Keywords: Cancer, Cardiovascular Disease, Case-Control, Case-Referent, Epidemiologic, Metal Exposure, Occupational, Mortality, Industry

Burdorf, A. and Sorock, G. (1997), Positive and negative evidence of risk factors for back disorders. *Scandinavian Journal of Work Environment & Health*, **23** (4), 243-256.

Full Text: [S\Sca J Wor EnvHea23, 243.pdf](S/Sca%20J%20Wor%20EnvHea23,%20243.pdf)

Abstract: The scientific literature on work-related back disorders was reviewed to identify consistent risk factors and to determine the strength of the association between the two. Thirty-five publications were selected with quantitative information. Lifting or carrying loads, whole-body vibration, and frequent bending and twisting proved to be the physical load risk factors consistently associated with work-related back disorders. Job dissatisfaction and low job decision latitude proved to be important, but the evidence was not consistent across different studies and study designs. The epidemiologic studies illustrated the importance of several confounders, especially age, smoking habits, and education. In this review, gender, height, weight, exercise, and marital status were consistently not associated with back disorders in occupational populations.

Keywords: Epidemiology, Lifting, Postural Load, Review, Vibration, Whole-Body Vibration, Lumbar Intervertebral-Disk, Musculoskeletal Disorders, Work-Environment, Postural Load, Occupational Epidemiology, Psychosocial Factors, Nursing Personnel, Pain, Drivers

? Greenland, S. (1999), Multilevel modeling and model averaging. *Scandinavian Journal of Work Environment & Health*, **25** (S4), 43-48.

Full Text: [1999\Sca J Wor Env Hea25, 43.pdf](1999/Sca%20J%20Wor%20Env%20Hea25,%2043.pdf)

Abstract: Multilevel modeling, also known as hierarchical regression, generalizes ordinary regression modeling to allow explicit and flexible compromises between simple and complex models. This article provides an elementary introduction to multilevel modeling as a model-averaging technique. Model averaging provides an alternative to model selection, and it emphasizes the role of prior information in finding good models.

Keywords: Mean Squared Error, Empirical-Bayes, Epidemiologic Analyses, Hierarchical Regression, Multiple Exposures, Dose-Response, Inference, Statistics, Likelihood, Cancer, Bayesian Statistics, Empirical-Bayes Estimation, Hierarchical Regression, Random-Coefficient Regression, Ridge Regression, Risk Assessment, Stein Estimation

Kristensen, T.S. (1999), Challenges for research and prevention in relation to work and cardiovascular diseases. *Scandinavian Journal of Work Environment & Health*, **25** (6), 550-557.

Full Text: [S\Sca J Wor EnvHea25, 550.pdf](S/Sca%20J%20Wor%20EnvHea25,%20550.pdf)

Abstract: The purpose of this paper is to discuss future challenges for research and prevention in the field of work environment and cardiovascular diseases (CVD). First, research on CVD and work during the last half of the 20th century is discussed. Second, the theories dominating the last 20 years are presented. Third, cardiovascular and occupational epidemiology are compared, and it is stressed that occupational epidemiology should avoid the individualistic bias of mainstream cardiovascular epidemiology. Finally, future challenges are discussed, and improvements are recommended concerning the use of intermediate end points, intervention research, theories about chemical and physical risk factors, the use of a unifying model for society, stress, and health, and the application of integrated prevention. It is concluded that research on CVD and work can play an important part in the development of integrated prevention strategies for the next century.

Keywords: Epidemiologic Methods, Ischemic Heart Disease, Psychosocial Factors, Review, Stress, Coronary Heart-Disease, Job Strain, Risk-Factors, Carotid Atherosclerosis, Myocardial-Infarction, Epidemiologic Literature, Decision Latitude, Workplace Demands, Swedish Men, Environment

Vermeulen, R., Stewart, P. and Kromhout, H. (2002), Dermal exposure assessment in occupational epidemiologic research. *Scandinavian Journal of Work Environment & Health*, **28** (6), 371-385.

Full Text: [S\Sca J Wor EnvHea28, 371.pdf](S/Sca%20J%20Wor%20EnvHea28,%20371.pdf)

Abstract: Recognition of the importance of skin exposure in industrial settings has steadily increased over the last few decades. Unfortunately, the growing attention to dermal exposure in industrial hygiene has often not been reflected in the field of occupational epidemiology. An extensive literature survey was conducted to identify dermal exposure assessment methods that have been applied in epidemiologic studies. Subsequently, methodologies are postulated that could be applied to epidemiologic research. Attention is given to intensity, frequency, and duration of exposure, the exposed surface area, and personal, temporal and spatial variability in dermal exposure and uptake. It is anticipated that, in the near future, dermal exposure assessment in epidemiologic research will be based generally on expert judgment and to some degree on process-specific exposure models. Field studies collecting quantitative dermal exposure data and statistical modeling to identify exposure determinants will, however, be imperative if progress is to be made in the field of dermal exposure assessment for epidemiologic purposes.

Keywords: Epidemiology, Exposure Assessment, Exposure Variability, Dermal Uptake, Review, Skin Exposure, Rubber-Manufacturing-Industry, Polycyclic Aromatic-Hydrocarbons, Polychlorinated-Biphenyls Pcbs, Percutaneous-Absorption, Hand Dermatitis, Inhalation Exposure, Pesticide Exposure, Urinary-Excretion, Measurement Error, Organic-Compounds

? Navarro, A. and Martin, M. (2004), Scientific production and international collaboration in occupational health, 1992-2001. *Scandinavian Journal of Work Environment & Health*, **30** (3), 223-233.

Full Text: [2004\Sca J Wor Env Hea30, 223.pdf](2004/Sca%20J%20Wor%20Env%20Hea30,%20223.pdf)

Abstract: Objectives The objectives of the present study were twofold, to describe international scientific production in occupational health and to examine international collaboration in this discipline.

Methods A bibliometric study was carried out, using Science Citation Index, in order to evaluate the articles published during the period 1992-2001 in eight representative occupational health journals. Scientific production, collaborative profiles for each country, and the significant relationships established between countries are reported.

Results One or more institutions in the United States had contributed to over 40% of the articles examined. The United States was followed by the United Kingdom (9.15%) and then Sweden (8.65%). When population size effects were eliminated, the Scandinavian countries proved to be the leading producers. After correction for gross domestic product, there was an increase in the ranking of apparently scientifically modest countries. The Scandinavian countries remained high. In terms of international collaboration in general, there was an inverse relationship between the production of a country and the proportion of articles co-authored with institutions in other countries. Finally, the significant relationships between countries permitted the identification of up to six large collaboration nuclei.

Conclusions The high absolute and relative Scandinavian production is suggestive of the great importance of occupational health in these countries. Access to publication by more modest countries, scientifically speaking, is observed to occur through collaboration with the high-production countries. In this sense, it would seem necessary to study the basis underlying these relationships. Finally, the characterization of the collaborative nuclei does not differ greatly from what was expected.

? Gehanno, J.F., Takahashi, K., Darmoni, S. and Weber, J. (2007), Citation classics in occupational medicine journals. *Scandinavian Journal of Work Environment & Health*, **33** (4), 245-251.

Full Text: [2007\Sca J Wor Env Hea33, 245.pdf](2007/Sca%20J%20Wor%20Env%20Hea33,%20245.pdf)

Abstract: Objectives The number of citations an article receives after its publication not only reflects its impact on the scientific community, but also the impact of the institutions or countries in the field studied. In 1987, Garfield introduced the concept of “citation classics” for the best-cited articles. An analysis of top-cited articles coming from journals in the field of occupational medicine (eg, Occupational and Environmental Medicine, Scandinavian Journal of Work, Environment & Health) has not yet been reported. The purpose of this study was to assess whether or not such citation classics exist in this field and to analyze their characteristics. Methods The most frequently cited articles published in the five major journals in occupational medicine were identified using the database of Science Citation Index Expanded. The data were obtained by searching one year and one journal at a time. All of the articles cited more than 100 times were collected and analyzed. Results Among the 15 553 articles published by the five journals since 1949, only 85 articles had been cited more than 100 times. The oldest had been published in 1950 and the latest in 1997. The United Kingdom contributed 28% of the citation classics and the United States or Sweden produced 19%. The most cited article had been cited 979 times. The main topics of articles were metabolism, occupational neoplasms, and work-related musculoskeletal disorders. Conclusions Since the 1980s, Scandinavia and the United States have taken the leadership in the publication of citation classic papers. Nevertheless, according to the level of citations, the influence of literature published in occupational medicine journals remains limited.

Keywords: Analysis, Archives, Bibliometrics, Citation, Citation Classics, Citation Index, Citations, Countries, Database, Environment, Field, Health, Impact, Journal, Journals, Leadership, Literature, Medicine, Most-Cited Articles, Neoplasms, Numerical Data, Occupational Health, Papers, Periodical, Publication, Science, Science Citation Index, Statistics, Sweden, United Kingdom, United States

Keywords: Bibliometrics, Journals

? Burdorf, A. and Viikari-Juntura, E. (2007), Bibliometric analysis of the *Scandinavian Journal of Work Environment & Health* - results from the past 10 years. *Scandinavian Journal of Work Environment & Health*, **33** (4), 318-319.

Full Text: [2007\Sca J Wor Env Hea33, 318.pdf](2007/Sca%20J%20Wor%20Env%20Hea33,%20318.pdf)

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Environment

? Kolstad, H.A. (2008), Nightshift work and risk of breast cancer and other cancers - A critical review of the epiderniologic evidence. *Scandinavian Journal of Work Environment & Health*, **34** (1), 5-22.

Full Text: [2008\Sca J Wor Env Hea34, 5.pdf](2008/Sca%20J%20Wor%20Env%20Hea34,%205.pdf)

Abstract: Objectives This systematic review concerns the role of nightshift work in the risk of breast cancer or other cancers. Methods Studies that specifically included information on nightshift or shift work and reported cancer occurrence were focused upon. A systematic search of Medline and the Science Citation Index was conducted until May 2007. The quality of each paper was discussed with respect to design, exposure and outcome information, bias, confounding, and exposure-response assessment. Results Thirteen relevant reports were found, and eight reported the relative risk for breast cancer, three for prostate cancer, three for colon cancer, and four for all cancers. Most of the studies had crude information about nightshift work, four register-linked studies had no individual exposure information but relied on exposure probabilities assessed on a group level, and no studies analyzed cancer risk according to the cumulative number of night shifts (however, most of the studies did so according to the number of years of nightshift work). Confounding did not seem to be of major concern. The presentation of the results was not always complete, and it would have been appreciated if the reasons for leaving some findings out had been reported. There were indications of a long-term effect of nightshift work (more than 20-30 years), but the number of positive studies was small. In addition, they were all conducted among nurses, and the risk estimates were only moderately increased. This situation makes the results sensitive to bias, chance, and confounding. Conclusions There is limited evidence for a causal association between nightshift work and breast cancer, while there is insufficient evidence for prostate cancer, colon cancer, and overall cancer.

Keywords: Assessment, Association, Bias, Breast Cancer, Cabin Attendants, Cancer, Chronobiology Disorder, Circadian Disruption, Circadian Rhythm, Citation, Collaborative Reanalysis, Commercial Airline Pilots, Confounding, Cumulative, Design, Endocrine Systems, Estimates, Evidence, Exposure, Female Flight Attendants, Indications, Information, Long Term, Long-Term, Melatonin Levels, Nurses, Occupational Exposure, Occupational Health, Outcome, Presentation, Prostate Cancer, Prostate-Cancer, Quality, Quality of, Relative Risk, Review, Risk, Role, Science, Science Citation Index, Shift Work, Shift-Work, Small, Systematic Review, Urinary 6-Sulfatoxymelatonin Levels, Work

? Rollin, L., Darmoni, S., Caillard, J.F. and Gehanno, J.F. (2009), Fate of abstracts presented at an International Commission on Occupational Health (ICOH) congress - followed by publication in peer-reviewed journals? *Scandinavian Journal of Work Environment & Health*, **35** (6), 461-465.

Full Text: [2009\Sca J Wor Env Hea35, 461.pdf](2009/Sca%20J%20Wor%20Env%20Hea35,%20461.pdf)

Abstract: Objectives Presentations at international meetings offer an excellent way to disseminate current research findings. One measure of the quality of research is jus subsequent publication. Our study aimed to determine the publication rate of abstracts presented at a congress of the International Commission on Occupational Health (ICOH), and to identify predictive factors of publication and differences between presented abstracts and subsequently published papers Methods We identified a random sample of 318 abstracts presented at the 2000 ICOH meeting from the book of abstracts. Using Medline and Embase, we assessed their publication rate in the period ranging from 1998 to 2006 and investigated the factors associated with the publication rate. Results Of 318 abstracts originating from 51 countries, 105 articles [33%, 95% confidence interval (95% CI) 27-38)] were subsequently published in 67 journals indexed in Medline or Embase. Mean time to publication was 17 months (95% CI 13-21). Multivariate analysis revealed that abstracts with quantitative data and written by authors originating from developed Countries were significantly more published From the time of abstract presentation to publication in a peer-reviewed journal, both the study sample size and the first author frequently changed (25% and 29%, respectively), but the overall conclusions remained stable, except in one case Conclusions Most of the abstracts presented at the 2000 ICOH congress were not subsequently published as full research reports. If this is the case for most abstracts submitted to conferences, this may limit the ability of a reader to judge the validity, reliability, and generalizability of the research presented. Caution is advised when referencing or generalizing from abstracts that have not been subsequently published in full.

Keywords: Bibliometrics, International, Medicine, Meetings, Peer Review, Scientific Meeting

? Rollin, L., Darmoni, S., Gaillard, J.F. and Gehanno, J.F. (2010), Searching for high-quality articles about intervention studies in occupational health - what is really missed when using only the Medline database? *Scandinavian Journal of Work Environment & Health*, **36** (6), 484-487.

Full Text: [2010\Sca J Wor Env Hea36, 484.pdf](2010/Sca%20J%20Wor%20Env%20Hea36,%20484.pdf)

Abstract: Objective Most occupational health physicians access electronic databases to obtain reliable medical information. Although it has been demonstrated that the use of Medline alone does not ensure comprehensiveness, many experts rely solely on this database. Our study aimed to discover to what extent the physician who limits his/her search to Medline misses studies of high quality. Methods We constructed a “gold standard” database of high-quality intervention studies gathering all the references included in the systematic reviews of the Cochrane Library and indexed under the topic “occupational health field”. We then searched all these references, one by one, in Medline. Results Overall, 88.8% [95% confidence interval (95% CI) 86.1-91.5] of the high quality studies included in our gold standard database were indexed in Medline. References included in reviews on psychiatric or psychological topics were significantly less often indexed in Medline [81.7% (95% CI 75.9-88.5)] than references included in reviews on other topics [92.2% (95% CI 89.5-95.0)] (P=0.001). Conclusion The recall ratio of Medline for high-quality intervention studies is close to 90%. For occupational health practitioners who aim to find reliable answers to their daily practice questions, searching Medline only is more cost-effective than previously thought.

Keywords: Bibliographic Databases, Bibliometrics, Databases, Embase, Gold, Information, References, Trials

# Title: Schizophrenia Bulletin

Full Journal Title: Schizophrenia Bulletin

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Nordgaard, J., Arnfred, S.M., Handest, P. and Parnas, J. (2008), The diagnostic status of first-rank symptoms. *Schizophrenia Bulletin*, **34** (1), 137-154.

Abstract: Objective: In the International Statistical Classification of Diseases, Tenth Revision(ICD-10) and Diagnostic and Statistical Manual of Mental Disorder, Third and Fourth Edition(DSM-III-IV), the presence of one of Schneider “first-rank symptoms” (FRS) is symptomatically sufficient for the schizophrenia diagnosis. Yet, it has been claimed that FRS may also be found in the nonschizophrenic conditions, and therefore, they are not specific or diagnostic for schizophrenia. This review was made to clarify the issue of diagnostic specificity. Methods: (1) A critical review of FRS studies published in English between 1970 and 2005. (2) A highlight of the 5 most frequently cited studies identified in the Web of Science. (3) Theoretical implications of the epistemological issues of FRS. Results: The reviewed studies do not allow for either a reconfirmation or a rejection of Schneider’s claims about FRS. The sources of disagreement between the studies are (1) including or excluding acute patients with potential degradation of consciousness; (2) assessing or not the phenomenological context; (3) assessing patients in different stages of their illness evolution; and (4) differential emphasis on mood symptoms and history of psychiatric symptoms. Conclusion: Both DSM-IV and ICD-10 emphasize FRS to a degree that is not supported by the empirical evidence. Until the status of FRS is clarified in depth, we suggest that the FRS, as these are currently defined, should be de-emphasized in the next revisions of our diagnostic systems. Future studies aiming at validation of FRS as diagnostic features need to apply a phenomenological perspective and include a homogenous group of patients across a wide spectrum of diagnoses.

Keywords: 1st Rank Symptoms, Acute, Classification, Criteria, Diagnosis, Diagnostic Systems, Diseases, DSM-IV, Follow-up, History, Illness, Kurt Schneider, Methods, Mood, Patients, Prevalence, Prognostic Implications, Psychosis, Review, Schizophrenia, Schizophrenia, Schneiderian Symptoms, Science, Specificity, Subjective Experience, Symptoms, Validation, Web of Science

# Title: Schizophrenia Research

Full Journal Title: [Schizophrenia Research](http://www.sciencedirect.com/science/journal/09209964)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Takei, N., Verdoux, H. and Nanko, S. (1996), Schizophrenia research activities in non-English speaking countries (13 EEC and 4 Asian countries): A MEDLINE survey. *Schizophrenia Research*, **18** (2-3), 245.

Full Text: [S\Sch Res18, 245.pdf](S/Sch%20Res18,%20245.pdf)

Abstract: We investigated schizophrenia research activities in 17 non-English speaking countries (13 EEC and 4 Asian countries) via a MEDLINE survey for publications of English-written papers over a period of 1990-94.

The averaged yearly numbers of all papers related to schizophrenia research that had appeared in MEDLINE were 45 (Germany), 40 (Japan), 26 (Sweden), 20 (Italy), 14 (Denmark), 10 (France), 9 (Netherlands), 8 (Finland), 7 (Spain), 5 (Austria), 3 (Belgium, Taiwan, and Greece), 2 (China and South Korea), and nil (Luxembourg and Portugal). Ten countries which produced more than 4 papers per year were further examined in terms of influence of research outputs. We only counted the papers which were published in main psychiatric journals with impact factor (a measure of how influential the paper is in research communication) above one. The yearly numbers of communicable papers adjusted for the number of doctors (per 10,000 doctors) in each country were as follows: 6.6 (Denmark), 4.9 (Sweden), 3.8 (Finland), 1.4 (Netherlands), 1.3 (Germany), 0.7 (Japan), 0.6 (Austria), 0.4 (Italy), 0.3 (France), and 0.2 (Spain).

? Theander, S.S. and Wetterberg, L. (2010), Schizophrenia in Medline 1950-2006: A bibliometric investigation. *Schizophrenia Research*, **118** (1-3), 279-284.

Full Text: [2010\Sch Res118, 279.pdf](2010/Sch%20Res118,%20279.pdf)

Abstract: The aim was to perform a bibliometric study, and compare the quantity of publications on schizophrenia with the total medical literature in Medline during 57 years, 1950-2006. The annual additions of literature to Medline are continually increasing and form the Medline growth curve. Comparisons of the number of publications on schizophrenia, or any other disease, to this curve, may be used to estimate the research activity. Methods for the identification of relevant references to papers on schizophrenia were evaluated and three different samples were operationally defined, retrieved and counted. During 1950-2006, 16.28 million references were added to Medline. Nearly 68000, 0.42%, references were related to schizophrenia. The percentage of papers on schizophrenia among the psychiatric literature decreased from 5.2 to 2.6%. The present study indicates that the number of references on schizophrenia in Medline has followed the general increase of medical publications. This pattern differs compared to some other research fields such as dementia, HIV, and peptic ulcer. Samples of references on schizophrenia may be retrieved in Medline by operational definitions of search methods. The quantity of schizophrenia research during 57 years has kept pace with the total medical literature. One interpretation of the results is that more resources are needed to enhance research activities on schizophrenia. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activities, Bibliometric, Bibliometric Study, Bibliometrics, Bipolar Disorder, Dementia, Eating-Disorders, Elsevier, General Psychiatric Journals, Growth, History, HIV, Identification, Interpretation, Literature, Medical, Medical Literature, Medline, Methods, Number, Number of Publications, Publications, Research, Research Activity, Schizophrenia, Science, Trends

# Title: School Psychology International

Full Journal Title: School Psychology International

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Jennings, R.L., Ehrhardt, K. and Poling, A. (2008), A bibliometric analysis of *School Psychology International* 1995-2007. *School Psychology International*, **29** (5), 515-528.

Full Text: [2008\Sch Psy Int29, 515.pdf](2008/Sch%20Psy%20Int29,%20515.pdf)

Abstract: The present study examined all articles published in School Psychology International from 1995 to 2007 to obtain data relevant to seven research questions: (1) which nations contributed articles to SPI? (2) how many SPI manuscripts involved multi-author (and multi-national) collaboration? (3) which institutions were the most prolific contributors to SPI? (4) what is the self-citation rate in SPI? (5) how often does SPI cite other major school psychology journals? (6) which first authors or editors were most frequently cited in SPI? (7) which books were the most frequently cited in SPI? Results indicate that the journal is broad in scope, interdisciplinary and truly international with respect to its contributors. Moreover, a substantial number of its contributions involve authors from two or more nations. In these regards, SPI is unique and, in our opinion, uniquely important for the international community of school psychologists.

Keywords: Authors, Bibliometric, Bibliometric Analysis, Bibliometric Study, Books, Citation Analysis, Collaboration, International Collaboration, Journal, Journals, Nations, Research, School Psychology International, School Psychology Journals, Self-Citation, Women, Women’s Participation

# Title: Schweizerische Medizinische Wochenschrift

Full Journal Title: Schweizerische Medizinische Wochenschrift

ISO Abbreviated Title: Schweiz. Med. Wochenschr.

JCR Abbreviated Title: Schweiz Med Wschr

ISSN: 0036-7672

Issues/Year: 52

Journal Country Switzerland

Language: Multi-Language

Publisher: Schwabe & Co Ag Verlag

Publisher Address: Farnsburgerstrasse 8, CH-4132 Muttenz 1, Switzerland

Subject Categories:

Medicine, General & Internal: Impact Factor

? Zenger, C.A. (1991), AIDS, right and wrong - Problems of HIV testing and medical confidentiality. *Schweizerische Medizinische Wochenschrift*, **121** (34), 1205-1211.

Abstract: The present Swiss legal position on the following two questions is described and discussed. First, under what circumstances can a physician test a patient for HIV antibodies (or, more generally, use diagnostic methods) without the patient’s express consent? Second, in what cases can he inform others of the patient’s HIV status (or, more generally, breach medical confidentiality) without the patient’s agreement? Informed consent of the person involved is the most important justification; as a rule the consent must be signified specifically and expressly both for tests and for the breach of confidentiality. Tacit consent may be assumed only in special circumstances; a request for a checkup, for example, in no way includes (for the present at any rate) tacit consent to HIV testing. Another possible justifying ground is protection of third parties. However, testing (especially secret tests) for the protection of medical and nursing staff is, in the present stage of development, neither suitable nor necessary for such protection and hence is legally unjustifiable. Nor, except in cases of admissible emergency assistance, is confidential notification of sexual partners legally admissible. Finally, there may be a justifying legal basis and overriding public interest in exceptional cases, e.g. where, in certain circumstances, the authorities order an open, compulsory HIV test in an individual case or unlinked tests for epidemiological purposes, or, if need be, for a physician’s notification of the public health authorities in cases of desperado behaviour by HIV positive patients. However, tests and breaking of medical confidentiality are in most cases of so little practical use in stemming the HIV epidemic that the interests they are held to serve - the fight against disease - carry little weight and do not override the interests of protecting the individual.

Keywords: Development, Disease, Emergency, HIV, HIV Testing, Interest, Medical, Nursing, Patients, Public Health, Sexual Partners

? Keusch, G.T., Hamer, D., Joe, A., Kelley, M., Griffiths, J. and Ward, H. (1995), Cryptosporidia: Who is at risk. *Schweizerische Medizinische Wochenschrift*, **125** (18), 899-908.

Abstract: *Cryptosporidium parvum* is a coccidian parasite originally described a century ago and, until recently, not considered to be a human pathogen. It has a complex life cycle, including both sexual and asexual reproduction, an auto-infectious cycle, and the ability to complete its development within a single host. The transmission form is a robust, environmentally resistant oocyst, excreted in the stool, which can exist for long periods of time in the environment. Because animals, in particular domesticated livestock, are its primary host, human infection is usually zoonotic. Oocysts often find their way into water supplies, and it resists chlorination and is incompletely filtered from processed drinking water supplies, even when filtration is working optimally. Transmission via ingestion of fecally contaminated swim ming pool water, food, fomites, and sexual activities facilitating fecal-oral inoculation have been demonstrated. The major target of *C. parvum* in the host is the intestinal apithelial cell, resulting in diarrhea, sometimes profuse and persistent, although it may also infect other organs such as the gall bladder and lungs. Pathogenesis involves attachment, probably via a sporozoite lectin, invasion, probably involving apical organelles, replication within a parasitophorous vacuole with the host cell membrane, causing cellular dysfunction. Diagnosis is generally made by visualization of the oocyst form in stool by staining methods, the best of which appears to be auramine and fluorescence microscopy. Those at greatest risk are immunocompromised adults and children, especially those with AIDS, children in day care, travelers to endemic regions, dairy or cattle farm workers of their families or contacts, household contacts of cases or carriers, and possibly owners of infected dogs or cats or their neighbors. There is no specific therapy available, however in the immunocompetent host the illness is self-limited, lasting from a few days to 3 weeks, and long term carriage is uncommon. In the immunocompromised host, infection is prolonged, sometimes asymptomatic, but may result in chronic debilitating diarrhea with dehydration, malabsorption and wasting. Public health measures to reduce contamination of water supplies and vigilent surveillance will reduce the risk to populations. Reducing behaviors favoring fecal-oral transmission, such as certain sexual activities, and scrupulous hygiene in the day care setting would also reduce the likelihood of transmission but not eliminate it. Given our lack of knowledge about *Cryptosporidium* biology and pathogenesis, high priority should be given to research designed to increase our understanding of the organism and improve the chance of developing useful therapeutic or preventative drugs or strategies.

? Navarro, F.A. (1997), The language of medicine in Switzerland from 1920 to 1995. *Schweizerische Medizinische Wochenschrift*, **127** (38), 1565-1573.

Abstract: Aim of study: It is generally accepted that since the end of the Second World War, English has become the main language in the medical field in Switzerland, but scarcely any objective data are available on the development of this process in this country. The aim of the present study was to analyze the frequency of the different languages in the literature references in articles published in the Swiss Medical Weekly over the past 75 years, with special attention to the possible differences existing between articles originating in German-speaking Switzerland and French-speaking Switzerland.

Methods: The language of publication of 47160 literature references cited in 2489 original articles published in the Swiss Medical Weekly between 1920 and 1995 was established. The 1730 articles published in German contained 32607 assessable references, the 759 articles published in French contained 14553 assessable references.

Results: The percentages of literature references in German, French and English cited in the articles written in German were, respectively, 83.6%, 9.1% and 5.9% in 1920, 68.6%, 7.2% and 18.3% in 1945, 30.7%, 5.6% and 61.9% in 1970, 11.3%, 1.5% and 86.7% in 1995. The percentages of literature references in French, German and English cited in the articles written in French were, respectively, 61.1%, 31.8% and 4.0% in 1920, 30.6%, 39.3% and 26.5% in 1945, 19.8%, 9.6% and 69.7% in 1970, 7.4%, 2.4% and 90.0% in 1995.

Conclusions: (1) Between 1945 and 1995 the percentage of literature references in English has increased continuously, while the percentages of references in German and French have decreased. (2) English replaced German as the main language of medicine towards 1955 in French-speaking Switzerland and towards 1965 in German-speaking Switzerland. (3) During the whole period studied (1920-1995), French-speaking authors cited publications in German more frequently than German-speaking authors cited publications in French. (4) The evolution of the relative importance of the languages in German-speaking Switzerland is very similar to that previously described in Germany and Austria. (5) In French-speaking Switzerland, on the other hand, the evolution of the relative importance of the different languages differs very considerably from that previously described in France.

Keywords: English, References, Clinica

? Kersnik, J. (2000), Predictive characteristics of users of alternative medicine. *Schweizerische Medizinische Wochenschrift*, **130** (11), 390-394.

Abstract: BACKGROUND: The use of alternative medicine has become an important factor in health care delivery.

OBJECTIVES: To evaluate patient characteristics, morbidity, functional status, quality of lift, satisfaction with care, practice characteristics and health care utilisation in general practice patients using alternative medicine.

DESIGN: Cross-sectional survey of CP patients completing a self-administered questionnaire. Setting: A stratified sample of 36 GP offices in Slovenia.

MAIN OUTPUT DATA: Patients’ age, sex, educational status, residence, presence of chronic condition, incidence of anxiety or depressive symptoms, incidence of patient-expressed need for emergency care in one year, data on self-care, data on functional status, quality of life, satisfaction with care, incidence of use of out-of-hours services and specialist or hospital services in users versus non-users.

RESULTS: 115/1753 patients (6.6%) reported visits to alternative practitioners in 1997. Users of alternative medicine were from midlife ago groups, were more likely to have a chronic condition had a lower perception of life quality and a higher incidence of anxiety and depressive symptoms, and had had more need for emergency treatment. They are heavier users of primary as well as secondary care services, they have changed their CP recently but are not significantly dissatisfied with their current regular GP.

CONCLUSIONS: Use of alternative medicine ay pears to bt: characteristic of patients with a more active approach to managing their problems. GPs should enquire about the use of alternative medicine by their patients, especially those moro likely to seek such help. Raising the question of alternative medicine will improve doctor-patient communication and help to resolve underlying health problems.

Keywords: Primary-Care Patients, Complementary, Therapies, States, Alternative Medicine, Health Care System, General Practitioner, General Medicine, Satisfaction With Care

# Title: SCI-Tech Information Development & Economy

Full Journal Title: [SCI-Tech Information Development & Economy](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=KJQB&NaviLink=%e7%a7%91%e6%8a%80%e6%83%85%e6%8a%a5%e5%bc%80%e5%8f%91%e4%b8%8e%e7%bb%8f%e6%b5%8e)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1005-6033

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Li, G.Z. (2006), A bibliometric analysis on Chinese knowledge organizations. *SCI-Tech Information Development & Economy*, **16** (8), 30-32.

Full Text: [2006\SCI-Tec Inf Dev Eco16, 30.pdf](2006/SCI-Tec%20Inf%20Dev%20Eco16,%2030.pdf)

Abstract: By using the statistical method and bibliometric method, and taking the literatures in the knowledge organizations’ research field published by China in period of 1989—2004, this paper makes quantitative analysis on the literature amount, publishing time, authors, institutions, periodicals distribution, and subject contents, etc.

Keywords: Knowledge Organization, Bibliometric Analysis, Quantitative Analysis

? Wu, L.J. and Hua, W.N. (2006), A quantitative analysis on papers, authors and Citations in from 2000 to 2005. *SCI-Tech Information Development & Economy*, **16** (16), 10-12.

Full Text: [2006\SCI-Tec Inf Dev Eco16, 10.pdf](2006/SCI-Tec%20Inf%20Dev%20Eco16,%2010.pdf)

Abstract: Applying the bibliometric statistical method, this paper makes quantitative analysis on the papers, authors and citations in from 2000 to 2005, sums up the features of the published papers and the distribution of the authors in this period in order to make known better the features of the periodical and provide some references to increase its academic level.

Keywords: Paper Analysis, Author Analysis, Citation Analysis

? Liu, X.Z., Teng, H.S. and Ma, A.Q. (2007), The statistical analysis on the papers, citations and authors of Chinese journal of stomatology. *SCI-Tech Information Development & Economy*, **17** (15), 47-49.

Full Text: [2007\SCI-Tec Inf Dev Eco17, 47.pdf](2007/SCI-Tec%20Inf%20Dev%20Eco17,%2047.pdf)

Abstract: This paper makes the statistical analysis on the papers, citations and authors of Chinese Journal of Stomatology from 2003 to 2005 by using the bibliometric method.

Keywords: Bibliometrics, Chinese Journal of Stomatology, Paper Analysis

# Title: Science

Full Journal Title: [Science](http://www.sciencemag.org/), [Science](http://uk.jstor.org/journals/00368075.html)

ISO Abbreviated Title: Science

JCR Abbreviated Title: Science

ISSN: 0036-8075

Issues/Year: 51

Journal Country United States

Language: English

Publisher: Amer Assoc Advancement Science

Publisher Address: 1200 New York Ave, NW, Washington, DC 20005

Subject Categories:

Multidisciplinary Sciences: Impact Factor 23.329 (2001)

? Gilbert, G.K. (1904), A case of plagiarism. *Science*, **20**, 115-116.

Full Text: [-1959\Science20, 115.pdf](-1959/Science20,%20115.pdf)

Keywords: Plagiarism

? Lotka, A.J. (1907), Relation between birth rates and death rates. *Science*, **26** (653), 21-22.

Full Text: [-1959\Science26, 21.pdf](-1959/Science26,%2021.pdf)

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Full Text: [-1959\Science52, 165.pdf](-1959/Science52,%20165.pdf)

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Abstract: The marker bed at the Cretaceous-Tertiary boundary of the Beloc Formation (southern Haiti) contains abundant coarse-grained microtektites and minor amounts of shocked quartz grains in the basal part. The upper part is composed of medium-grained marl with amalgamated microtektite lenses and finer-grained marl lenses disseminated throughout. Field and petrographic observations, and the distribution of planktonic foraminifera suggest that the bed formed from a complex sequence of events. A bolide impact nearby produced microtektites that settled to form a nearly pure layer at the base. Vaporized materials with anomalously high extraterrestrial components settled last, along with carbonate sediments. The entire bed became sparsely consolidated. Subsequently, another major disruptive event, perhaps a giant tsunami, partly reworked the initial deposit. Cohesive fragments of the original marker bed mixed with exotic materials were redeposited as lenticular bodies. This process also may have caused further mixing of Cretaceous and Tertiary microfossils, as observed at Beloc and elsewhere.

Keywords: Extinction, Foraminifera, Texas

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Abstract: Nonequilibrium states of surface composition can be extremely long-lived when polymer chains adsorb competitively. In a model system (polymethylmethacrylate adsorbed from CCl4 onto oxidized silicon previously saturated with polystyrene), it is shown that a weakly adsorbing polymer was sterically pinned to a surface by a more strongly adsorbing polymer. The dynamical evolution of the surface composition was strongly nonexponential in time and non-Arrhenius in temperature, the phenomenology is analogous to bulk glasses. This interpretation offers a new mechanism to explain why weakly adsorbing chains may bind to surfaces, as well as a direction in which to look for a method to release them.

Keywords: Solid-Liquid Interface, Kinetics, Exchange

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Abstract: Water surged from Puget Sound sometime between 1000 and 1100 years ago, overrunning tidal marshes and mantling them with centimeters of sand. One overrun site is 10 kilometers northwest of downtown Seattle, another is on Whidbey Island, some 30 kilometers farther north. Neither site has been widely mantled with sand at any other time in the past 2000 years. Deposition of the sand coincided-to the year or less-with abrupt, probably tectonic subsidence at the Seattle site and with landsliding into nearby Lake Washington. These findings show that a tsunami was generated in Puget Sound, and they tend to confirm that a large shallow earthquake occurred in the Seattle area about 1000 years ago.

Keywords: Calibration, State

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Abstract: Radiocarbon ages of submerged trees on landslide deposits in Lake Washington, Seattle, indicate that the most recent slides in three separate areas may have occurred simultaneously about 1000 years ago. Tree ring crossdating shows that seven bark- bearing trees from one of these recent slides and a tree 23 kilometers to the northwest in a probable tsunami deposit on the shore of Puget Sound died in the same season of the same year. The close coincidence among the most recent lake landslides, a probable tsunami, abrupt subsidence, and other possible seismic events gives evidence for a strong prehistoric earthquake in the Seattle region.

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Abstract: The analysis of the differences between two complex genomes holds promise for the discovery of infectious agents and probes useful for genetic studies. A system was developed in which subtractive and kinetic enrichment was used to purify restriction endonuclease fragments present in one population of DNA fragments but not in another. Application of this method to DNA populations of reduced complexity (“representations”) resulted in the isolation of probes to viral genomes present as single copies in human DNA, and probes that detect polymorphisms between two individuals. In principle, this system, called representational difference analysis (RDA), may also be used for isolating probes linked to sites of genomic rearrangements, whether occurring spontaneously and resulting in genetic disorders or cancer, or programmed during differentiation and development.

Keywords: Amplification, Cancer, Deletion, Development, DNA, Multidisciplinary, Patient, Science, Sequences

Oppenheimer, D., Beroza, G., Carver, G., Dengler, L., Eaton, J., Gee, L., Gonzalez, F., Jayko, A., Li, W.H., Lisowski, M., Magee, M., Marshall, G., Murray, M., Mcpherson, R., Romanowicz, B., Satake, K., Simpson, R., Somerville, P., Stein, R. and Valentine, D. (1993), The Cape Mendocino, California, Earthquakes of April 1992 - Subduction at the Triple Junction. *Science*, **261** (5120), 433-438.

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Abstract: The 25 April 1992 magnitude 7.1 Cape Mendocino thrust earthquake demonstrated that the North America-Gorda plate boundary is seismogenic and illustrated hazards that could result from much larger earthquakes forecast for the Cascadia region. The shock occurred just north of the Mendocino Triple Junction and caused strong ground motion and moderate damage in the immediate area. Rupture initiated onshore at a depth of 10.5 kilometers and propagated up-dip and seaward. Slip on steep faults in the Gorda plate generated two magnitude 6.6 aftershocks on 26 April. The main shock did not produce surface rupture on land but caused coastal uplift and a tsunami. The emerging picture of seismicity and faulting at the triple junction suggests that the region is likely to continue experiencing significant seismicity.

Keywords: Coast, Deformation, Depths, Faults, Gorda Plate, Northern California, Tectonics, Zone

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Abstract: A model of the desorption and adsorption of a polymer layer at a planar surface indicates a transition from exponential kinetics at high temperatures to nonexponential kinetics (stretched exponential with index one-half) at lower temperatures where these processes are diffusion-limited. Measurements of polystyrene desorption through polyisoprene over-layers show this predicted transition. Corroborative results are obtained for polystyrene desorption through polymethylmethacrylate overlayers. This identification of two distinct kinetic regimes suggests a unifying perspective from which to analyze polymer and biopolymer mobility at surfaces.

Keywords: Adsorbed Polymer, Diffusion, Exchange, Layer, Relaxation, Dynamics, Surfaces

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Abstract: Forest systems cover more than 4.1 x 10(9) hectares of the Earth's land area. Globally, forest vegetation and soils contain about 1146 petagrams of carbon, with approximately 37 percent of this carbon in low-latitude forests, 14 percent in mid-latitudes, and 49 percent at high latitudes. Over two-thirds of the carbon in forest ecosystems is contained in soils and associated peat deposits. In 1990, deforestation in the low latitudes emitted 1.6 +/- 0.4 petagrams of carbon per year, whereas forest area expansion and growth in mid- and high-latitude forest sequestered 0.7 +/- 0.2 petagrams of carbon per year, for a net flux to the atmosphere of 0.9 +/- 0.4 petagrams of carbon per year. Slowing deforestation, combined with an increase in forestation and other management measures to improve forest ecosystem productivity, could conserve or sequester significant quantities of carbon. Future forest carbon cycling trends attributable to losses and regrowth associated with global climate and land-use change are uncertain. Model projections and some results suggest that forests could be carbon sinks or sources in the future.

Keywords: Climate Change, Tropical Forests, Atmospheric Carbon, Transient-Response, CO2 Concentration, Increasing CO2, United-States, Elevated CO2, Storage, Biomass

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Abstract: Injectable nanoparticulate carriers have important potential applications such as site-specific drug delivery or medical imaging. Conventional carriers, however, cannot generally be used because they are eliminated by the reticulo-endothelial system within seconds or minutes after intravenous injection. To address these limitations, monodisperse biodegradable nanospheres were developed from amphiphilic copolymers composed of two biocompatible blocks. The nanospheres exhibited dramatically increased blood circulation times and reduced liver accumulation in mice. Furthermore, they entrapped up to 45 percent by weight of the drug in the dense core in a one-step procedure and could be freeze-dried and easily redispersed without additives in aqueous solutions.

Keywords: Particles, Liposomes

Ihmlé, P.F. and Jordan, T.H. (1994), Teleseismic search for slow precursors to large earthquakes. *Science*, **266** (5190), 1547-1551.

Full Text: [S\Science266, 1547.pdf](S/Science266,%201547.pdf)

Abstract: Some large earthquakes display low-frequency seismic anomalies that are best explained by episodes of slow, smooth deformation immediately before their high-frequency origin times. Analysis of the low-frequency spectra of 107 shallow-focus earthquakes revealed 20 events that had slow precursors (95 percent confidence level), 19 were slow earthquakes associated with the ocean ridge-transform system, and 1 was a slow earthquake on an intracontinental transform fault in the East African Rift system. These anomalous earthquakes appear to be compound events, each comprising one or more ordinary (fast) ruptures in the shallow seismogenic zone initiated by a precursory slow event in the adjacent or subjacent lithosphere.

Keywords: Mexico, Mode, Ridge, Seismic Moment, Sequence, Source Parameters, Spectra, Tsunami Earthquake

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Keywords: Hope, Misconduct, Plagiarism

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Full Text: [1996\Science422, 1045.pdf](1996/Science422,%201045.pdf)

Abstract: This is the third in a series of six pages in Science linked to features on the Science’s Next Wave, the new AAAS/Science World Wide Web project for young scientists (http://sci.aaas.org/nextwave). This story focuses on scientifically trained people who made the transition to a new career niche in regulatory affairs.

Keywords: Niche, World Wide Web

Notes: highly cited

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Full Text: [1996\Science273, 483.pdf](1996/Science273,%20483.pdf)

Abstract: Fullerene single-wall nanotubes (SWNTs) were produced in yields of more than 70 percent by condensation of a laser-vaporized carbon-nickel-cobalt mixture at 1200°C. X-ray diffraction and electron microscopy showed that these SWNTs are nearly uniform in diameter and thai they self-organize into “ropes,” which consist of 100 to 500 SWNTs in a two-dimensional triangular lattice with a lattice constant of 17 angstroms. The x-ray form factor is consistent with that of uniformly charged cylinders 13.8±0.2 angstroms in diameter. The ropes were metallic, with a single-rope resistivity of <10-4 ohm-centimeters at 300 kelvin. The uniformity of SWNT diameter is attributed to the efficient annealing of an initial fullerene tubelet kept open by a few metal atoms, the optimum diameter is determined by competition between the strain energy of curvature of the graphene sheet and the dangling-bond energy of the open edge, where growth occurs. These factors strongly favor the metallic (10,10) tube with C-5v symmetry and an open edge stabilized by triple bonds.

Keywords: Growth

? Li, X.G. and Xiong, L. (1996), Scientific misconduct - Chinese researchers debate rash of plagiarism cases. *Science*, **274** (5286), 337-338.

Keywords: Misconduct, Plagiarism, Researchers, Scientific Misconduct

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Abstract: Large-scale synthesis of aligned carbon nanotubes was achieved by using a method based on chemical vapor deposition catalyzed by iron nanoparticles embedded in mesoporous silica. Scanning electron microscope images show that the nanotubes are approximately perpendicular to the surface of the silica and form an aligned array of isolated tubes with spacings between the tubes of about 100 nanometers. The tubes are up to about 50 micrometers long and well graphitized. The growth direction of the nanotubes may be controlled by the pores from which the nanotubes grow.

Keywords: Field-Emission, Growth, Tubules, Microtubules

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Keywords: China, Plagiarism

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Abstract: Opinion. Comments on universities in the United Kingdom (UK). Results of a government’s 1997 research assessment exercise, What the results revealed, How the universities were rated.

Williams, N. (1997), UK universities: Declining enrollments, funds threaten small departments. *Science*, **275** (5301), 747.

Full Text: [S\Science275, 747.pdf](S/Science275,%20747.pdf) [S\Science275, 747a.pdf](S/Science275,%20747a.pdf)

Abstract: Reports on the challenges faced by small British university science departments in light of privatization efforts undertaken by the British government. Some smaller departments forced to close for economic reasons, Government funding guidelines laid down by the Higher Education Council for England, Changes wrought at various colleges.

May, R.M. (1997), The scientific wealth of nations. *Science*, **275** (5301), 793-796.

Full Text: [S\Science275, 793.pdf](S/Science275,%20793.pdf)

Abstract: Presents comparisons of scientific research outputs among several countries. Source of data, Publications and citations, Patterns of change, Discussion, A chart of the world’s top countries in science, medicine, and engineering research.

May, R.M. (1997), Science by the country: Response. *Science*, **276** (5314), 885.

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Full Text: [1997\Science276, 1395.pdf](1997/Science276,%201395.pdf)

Abstract: A high-capacity lithium-storage material in metal-oxide form has been synthesized that can replace the carbon-based lithium intercalation materials currently in extensive use as the negative electrode (anode) of lithium-ion rechargeable batteries. This tin-based amorphous composite oxide (TCO) contains Sn(II)-O as the active center for lithium insertion and other glass-forming elements, which make up an oxide network. The TCO anode yields a specific capacity for reversible lithium adsorption more than 50 percent higher than those of the carbon families that persists after charge-discharge cycling when coupled with a lithium cobalt oxide cathode. Lithium-7 nuclear magnetic resonance measurements evidenced the high ionic state of lithium retained in the charged state, in which TCO accepted 8 moles of lithium ions per unit mole.

Keywords: Batteries**,** Intercalation**,** Carbons

Williams, N. (1997), UK universities: The end of equality. *Science*, **277** (5326), 628-629.

Full Text: [S\Science277, 628.pdf](S/Science277,%20628.pdf) [S\Science277, 628a.pdf](S/Science277,%20628a.pdf)

Abstract: Reports on the changes being made in higher education in Great Britain. Items from a report written by a panel led by Ron Dearing, The ending of free higher education in Great Britain, Recommendations cited in the report, Reasons behind the creation of the report, Traditional funding from the dual-support system, Dearing’s radical proposals, Report as not being favorably received, The government’s acceptance of some of the recommendations. INSET: Dearing puts a price on education.

Grant, J. and Lewison, G. (1997), Government funding of research and development. *Science*, **278** (5339), 878-879.

Full Text: [S\Science278, 878.pdf](S/Science278,%20878.pdf)

Keywords: Funding, Research, Science

Rhodes, F.H.T. (1997), Academic duty: Kennedy, D. *Science*, **278** (5344), 1726.

Full Text: [S\Science278, 1726.pdf](S/Science278,%201726.pdf)

Abstract: Reviews the book ‘Academic Duty’, by Donald Kennedy. INSET: Reprints of books previously reviewed.

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Full Text: 1998\Science279, 473.pdf

Keywords: Medline, Misconduct, Plagiarism, Scientific Misconduct

? Marshall, E. (1998), The Internet: A powerful tool for plagiarism sleuths. *Science*, **279** (5350), 474.

Full Text: 1998\Science279, 474.pdf

Keywords: Internet, Plagiarism

Notes: highly cited

? Zhao, D.Y., Feng, J.L., Huo, Q.S., Melosh, N., Fredrickson, G.H., Chmelka, B.F. and Stucky, G.D. (1998), Triblock copolymer syntheses of mesoporous silica with periodic 50 to 300 angstrom pores. *Science*, **279** (5350), 548-552.

Full Text: [1998\Science279, 548.pdf](1998/Science279,%20548.pdf)

Abstract: Use of amphiphilic triblock copolymers to direct the organization of polymerizing silica species has resulted in the preparation of well-ordered hexagonal mesoporous silica structures (SBA-15) with uniform pore sizes up to approximately 300 angstroms, The SBA-15 materials are synthesized in acidic media to produce highly ordered, two-dimensional hexagonal (space group p6mm) silica-block copolymer mesophases, Calcination at 500 degrees C gives porous structures with unusually large interlattice d spacings of 74.5 to 320 angstroms between the (100) planes, pore sizes from 46 to 300 angstroms, pore volume fractions up to 0.85, and silica wall thicknesses of 31 to 64 angstroms. SBA-15 can be readily prepared over a wide range of uniform pore sizes and pore wall thicknesses at low temperature (35 degrees to 80 degrees C), using a variety of poly(alkylene oxide) triblock copolymers and by the addition of cosolvent organic molecules, The block copolymer species can be recovered for reuse by solvent extraction with ethanol or removed by heating at 140 degrees C for 3 hours, in both cases, yielding a product that is thermally stable in boiling water.

Keywords: Molecular-Sieves, MCM-41, Mechanism, Templates, Behavior, Phases

Notes: highly cited

? Chan, J.M., Stampfer, M.J., Giovannucci, E., Gann, P.H., Ma, J., Wilkinson, P., Hennekens, C.H. and Pollak, M. (1998), Plasma insulin-like growth factor I and prostate cancer risk: A prospective study. *Science*, **279** (5350), 563-566.

Full Text: [1998\Science279, 563.pdf](1998/Science279,%20563.pdf)

Abstract: Insulin-like growth factor-I (IGF-I) is a mitogen for prostate epithelial cells. To investigate associations between plasma IGF levels and prostate cancer risk, a nested case-control study within the Physicians’ Health Study was conducted on prospectively collected plasma from 152 cases and 152 controls. A strong positive association was observed between IGF-I levels and prostate cancer risk. Men in the highest quartile of IGF-I levels had a relative risk of 4.3 (95 percent confidence interval 1.8 to 10.6) compared with men in the lowest quartile. This association was independent of baseline prostate-specific antigen levels. Identification of plasma IGF-I as a predictor of prostate cancer risk may have implications for risk reduction and treatment.

Keywords: Body-Mass Index, Binding-Proteins, Hormone, Sex, Adolescents, Children, Antigen, Cells, Stage, Age

Williams, N. (1998), UK universities: Government stalls on Dearing challenge. *Science*, **279** (5356), 1446.

Full Text: [S\Science279, 1446.pdf](S/Science279,%201446.pdf)

Abstract: Explains that reforms of Great Britain’s higher education system have been delayed because of a comprehensive review of government spending. Reforms called for by a report led by Lord Dearing, Details about Dearing report, Role of industry in funding research infrastructure, Problems with Britain’s dual support research system.

Normile, D. (1998), Japan budget: New projects receive boast as cuts pinch current work. *Science*, **280** (5364), 669.

Full Text: [S\Science280, 669.pdf](S/Science280,%20669.pdf)

Abstract: Describes the funding strategy of the Japanese government for science and research, as of May 1, 1998. Impact of budget decisions and regulations, Drive to reduce the federal deficit, Threat to international research and development (R&D) projects, Goal of fiscal reform for government, Effects of budget cuts on basic research, Views of scientists about financial situation, Funding for new stimulus package.

Rotberg, I.C. (1998), Interpretation of international test score comparisons. *Science*, **280** (5366), 1030-1031.

Full Text: [S\Science280, 1030.pdf](S/Science280,%201030.pdf)

Abstract: Evaluates the data gathered by the Third International Mathematics and Science Study (TIMSS). Study’s methodological difficulties, Why such test scores provide little information about educational quality, Sampling, Eligible populations, Age and grade, Type of school and poverty, Cumulative effects, Policy implications, Alternative criteria which should be used.

May, R.M. (1998), The scientific investments of nations. *Science*, **281** (5373), 49-51.

Full Text: [S\Science281, 49.pdf](S/Science281,%2049.pdf)

Abstract: Surveys and draws tentative conclusions from the diverse patterns of investment in scientific research and development of the leading countries of the world. Governments as the principal funders of basic research, Funding of applied research by governments to inform public policy and operation, Encouragement by governments of business research and development to sharpen the competitive edge of their industries and increase national wealth.

Balter, M. (1998), France: Allégre sets tough targets for research. *Science*, **281** (5376), 498.

Full Text: [S\Science281, 498.pdf](S/Science281,%20498.pdf)

Abstract: Reports that as of July 1998, France has decided to set high scientific goals for the years to come. The hopes to double the impact of its scientific publications, triple its international patents, and create new technology companies, Claude Allegre, France’s research and education manager and his planned strategies.

Bilek, S.L. and Lay, T. (1998), Variation of interplate fault zone properties with depth in the Japan subduction zone. *Science*, **281** (5380), 1175-1178.

Full Text: [S\Science281, 1175.pdf](S/Science281,%201175.pdf)

Abstract: The depth dependence of physical properties along the Japan subduction zone interface was explored using teleseismic recordings of earthquake signals. Broadband body waves were inverted to determine the duration of rupture and source depth for 40 interplate thrust earthquakes located offshore of Honshu between 1989 and 1995. After scaling for differences in seismic moment, there is a systematic decrease in rupture duration with increasing depth along the subducting plate interface. This indicates increases in rupture velocity or stress drop with depth, Likely related to variation in rigidity of sediments on the megathrust.

Keywords: Accretionary, Asperity, December 28, Large Earthquake Occurrence, Mechanism, Rupture Process, Sanriku-Oki, Seismicity, Trench, Tsunami Earthquake

Normile, D. (1998), Japan’s education minister: Vocal critic gets chance to put his ideas into practice. *Science*, **281** (5382), 1435-1436.

Full Text: [S\Science281, 1435.pdf](S/Science281,%201435.pdf)

Abstract: Focuses on physicist Akito Arima as one of Japan’s most persistent critics of the country’s science and educational policies. His appointment as head of the Monbusho, the Ministry of Education, Science, Sports and Culture, Education, Political issues he is familiar with, Major challenges as minister, Comments of Arima.

Notes: highly cited (> 1000)

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Full Text: [1998\Science281, 1647.pdf](1998/Science281,%201647.pdf)

Abstract: Cold clusters ranging in diameter from 1 to 6 nanometers have been prepared on single crystalline surfaces of titania in ultrahigh vacuum to investigate the unusual size dependence of the Low-temperature catalytic oxidation of carbon monoxide. Scanning tunneling microscopy/spectroscopy (STM/STS) and elevated pressure reaction kinetics measurements show that the structure sensitivity of this reaction on gold clusters supported on titania is related to a quantum size effect with respect to the thickness of the gold islands, islands with two Layers of gold are most effective for catalyzing the oxidation of carbon monoxide. These results suggest that supported clusters, in general, may have unusual catalytic properties as one dimension of the cluster becomes smaller than three atomic spacings.

Keywords: Adsorption, Au, Carbon, Carbon Monoxide, Cluster, Co Oxidation, Films, Gold, Growth, Kinetics, Measurements, Oxidation, Oxygen, Pd, Reaction Kinetics, Surface, TiO2, TiO2 (110), Titania, USA

Adams, A. (1998), Citation analysis: Harvard tops in scientific impact. *Science*, **281** (5385), 1936.

Full Text: [S\Science281, 1436.pdf](S/Science281,%201436.pdf)

Abstract: Announces that Harvard University has topped the ranking of research universities in the United States based on the report of ScienceWatch magazine. How the ranking was calculated, Indications of biological ranking, Information on other top universities in biological sciences.

Notes: highly cited (> 1000)

? Caruso, F., Caruso, R.A. and Mohwald, H. (1998), Nanoengineering of inorganic and hybrid hollow spheres by colloidal templating. *Science*, **282** (5391), 1111-1114.

Full Text: [1998\Science282, 1111.pdf](1998/Science282,%201111.pdf)

Abstract: Hollow silica and silica-polymer spheres with diameters between 720 and 1000 nanometers were fabricated by consecutively assembling silica nanoparticles and polymer onto colloids and subsequently removing the templated colloid either by calcination or decomposition upon exposure to solvents. Scanning and transmission electron microscopy images demonstrate that the wall thickness of the hollow spheres can be readily controlled by varying the number of nanoparticle-polymer deposition cycles, and the size and shape are determined by the morphology of the templating colloid. The hollow spheres produced are envisioned to have applications in areas ranging from medicine to pharmaceutics to materials science.

Keywords: Adsorption, Applications, Calcination, Carbonate, Colloid, Decomposition, Deposition, Exposure, Germany, Gold, Hematite, Medicine, Microspheres, Morphology, Multilayer Films, Nanoparticles, Particles, Polyelectrolyte, Polymer, Science, Silica, Transmission

Schmidt, W.H. and McKnight, C.C. (1998), Policy forum: Science education - What can we really learn from TIMSS? *Science*, **282** (5395), 1830-1831.

Full Text: [S\Science282, 1830.pdf](S/Science282,%201830.pdf)

Abstract: Explains the results of the Third International Mathematics and Science Study (TIMSS). Concern about the quality of precollege education in science and math, Data from 40 countries, Facets covered by TIMSS, Analysis of official curriculum documents and surveys of students, teachers, and officials, Decline in relative standing of United States students, Tie between achievement and curricular emphases, Criticism of TIMSS.

Notes: highly cited

? Grunig, G., Warnock, M., Wakil, A.E., Venkayya, R., Brombacher, F., Rennick, D.M., Sheppard, D., Mohrs, M., Donaldson, D.D., Locksley, R.M. and Corry, D.B. (1998), Requirement for IL-13 independently of IL-4 in experimental asthma. *Science*, **282** (5397), 2261-2263.

Full Text: [1998\Science282, 2261.pdf](1998/Science282,%202261.pdf)

Abstract: The pathogenesis of asthma reflects, in part, the activity of T cell cytokines. Murine models support participation of interleukin-4 (IL-4) and the IL-4 receptor in asthma. Selective neutralization of IL-13, a cytokine related to IL-4 that also binds to the alpha chain of the IL-4 receptor, ameliorated the asthma phenotype, including airway hyperresponsiveness, eosinophil recruitment, and mucus overproduction. Administration of either IL-13 or IL-4 conferred an asthma-like phenotype to nonimmunized T cell-deficient mice by an IL-4 receptor alpha chain-dependent pathway. This pathway may underlie the genetic associations of asthma with both the human 5q31 Locus and the IL-4 receptor.

Keywords: Airway Hyperreactivity, T-Lymphocytes, Mice, Interleukin-4, Expression, Model, Lung, Inflammation, Eosinophilia, Induction

Cuénod, M. (1999), On the frontiers of science. *Science*, **283** (5400), 325.

Full Text: [S\Science283, 325.pdf](S/Science283,%20325.pdf)

Notes: highly cited

? Bhalla, U.S. and Iyengar, R. (1999), Emergent properties of networks of biological signaling pathways. *Science*, **283** (5400), 381-387.

Full Text: [1999\Science283, 381.pdf](1999/Science283,%20381.pdf)

Abstract: Many distinct signaling pathways allow the cell to receive, process, and respond to information. Often, components of different pathways interact, resulting in signaling networks. Biochemical signaling networks were constructed with experimentally obtained constants and analyzed by computational methods to understand their role in complex biological processes. These ner:works exhibit emergent properties such as integration of signals across multiple time scales, generation of distinct outputs depending on input strength and duration, and self-sustaining feedback Loops. Feedback can result in bistable behavior with discrete steady-state activities, well-defined input thresholds for transition between states and prolonged signal output, and signal modulation in response to transient stimuli. These properties of signaling networks raise the possibility that information for “learned behavior” of biological systems may be stored within intracellular biochemical reactions that comprise signaling pathways.

Keywords: Protein-Kinase-C, Long-Term Potentiation, Inositol Trisphosphate, Catalytic Activity, Adenylyl Cyclases, Activates RAF-1, Cyclic-Amp, Area CA1, Calcium, Phosphorylation

? Miller, E.D. (1999), Johns Hopkins plagiarism policies. *Science*, **283** (5406), 1265.

Full Text: 1999\Science283, 1265.pdf

Keywords: Plagiarism, Policies

Braun, T., Glänzel, W., Schubert, A.P. and Schubert, G.A. (1999), Hungarian virtues. *Science*, **284** (5415), 741-742.

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Jensen, M.N. (1999), Science education: Reinventing the science master’s degree. *Science*, **284** (5420), 1610-1611.

Full Text: [S\Science284, 1610.pdf](S/Science284,%201610.pdf)

Abstract: Discusses the Sloan Foundation’s experiment that is offering a graduate science degree tailored toward careers in business and industry rather than in academics--an alternative to a doctor of philosophy degree (Ph.D.). Example of Jarrell Pair, whose specialty is human-computer interaction, Comments about the program from Sheila Tobias, who wrote the book ‘Rethinking Science as a Career’, Hurdles facing students of the new science program, Schools who are participating with the experiment.

Franck, G. (1999), Scientific communication: A vanity fair? *Science*, **286** (5437), 53-55.

Full Text: [S\Science286, 53.pdf](S/Science286,%2053.pdf)

Abstract: Discusses scientific communication. How science can function rationally, Why money is not the main motive for engaging in science, Details on the accounting system from the Science Citation Index.

Notes: highly cited (> 1000)

? Liu, C., Fan, Y.Y., Liu, M., Cong, H.T., Cheng, H.M. and Dresselhaus, M.S. (1999), Hydrogen storage in single-walled carbon nanotubes at room temperature. *Science*, **286** (5442), 1127-1129.

Full Text: [1999\Science286, 1127.pdf](1999/Science286,%201127.pdf)

Abstract: Masses of single-walled carbon nanotubes (SWNTs) with a large mean diameter of about 1.85 nanometers, synthesized by a semicontinuous hydrogen are discharge method, were employed for hydrogen adsorption experiments in their as-prepared and pretreated states. A hydrogen storage capacity of 4.2 weight percent, or a hydrogen to carbon atom ratio of: 0.52, was achieved reproducibly at room temperature under a modestly high pressure (about 10 megapascal) for a SWNT sample of about 500 milligram weight that was soaked in hydrochloric acid and then heat-treated in vacuum. Moreover, 78.3 percent of the adsorbed hydrogen (3.3 weight percent) could be released under ambient pressure at room temperature, while the release of the residual stored hydrogen (0.9 weight percent) required some heating of the sample. Because the SWNTs can be easily produced and show reproducible and modestly high hydrogen uptake at room temperature, they show promise as an effective hydrogen storage material.

Keywords: Adsorption, Ambient, Capacity, Carbon, Carbon Nanotubes, China, Diameter Distribution, Discharge, Heating, Hydrochloric Acid, Hydrogen, Hydrogen Storage, Nanotubes, Storage, Temperature, Uptake

Greenwood, M.R.C. and North, K.K. (1999), Science through the looking glass: Winning the battles but losing the war? *Science*, **286** (5447), 2072-2078.

Full Text: [S\Science286, 2072.pdf](S/Science286,%202072.pdf)

Abstract: Ponders on the reasons to believe that the legacy of scientific success will not be perpetuated as the world enters the next millennium. Science literacy for all people in the United States, Issue on K-12 science and math education, Diversity, Science education in conflict with political and personal agendas, Battles of discovery that influenced society, Battles of public opinion, Battles in response to crisis.

Normile, D. (1999), Taiwan: Science staggers along after deadly earthquake. *Science*, **286** (5449), 2444.

Full Text: [S\Science286, 2444.pdf](S/Science286,%202444.pdf)

Abstract: Focuses on the devastation that was created by an earthquake on September 21, 1999, to the Food Science Building at Taiwan’s National Chung Hsing University. Earthquake’s toll on university equipment and instruments, Actions taken by university officials concerning the aftermath of the earthquake.

Notes: highly cited (> 1000)

? Collins, P.G., Bradley, K., Ishigami, M. and Zettl, A. (2000), Extreme oxygen sensitivity of electronic properties of carbon nanotubes. *Science*, **287** (5459), 1801-1804.

Full Text: [2000\Science287, 1801.pdf](2000/Science287,%201801.pdf)

Abstract: The electronic properties of single-walled carbon nanotubes are shown here to be extremely sensitive to the chemical environment. Exposure to air or oxygen dramatically influences the nanotubes’ electrical resistance, thermoelectric power, and Local density of states, as determined by transport measurements and scanning tunneling spectroscopy. These electronic parameters can be reversibly “tuned” by surprisingly small concentrations of adsorbed gases, and an apparently semiconducting nanotube can be converted into an apparent metal through such exposure. These results, although demonstrating that nanotubes could find use as sensitive chemical gas sensors, Likewise indicate that many supposedly intrinsic properties measured on as-prepared nanotubes may be severely compromised by extrinsic air exposure effects.

Keywords: Adsorption, Air, Carbon, Carbon Nanotubes, Concentrations, Effects, Environment, Exposure, Gases, Graphite Nanofibers, Hydrogen, Measurements, Metal, Nanotube, Nanotubes, Parameters, Resistance, Ropes, Spectroscopy, Storage, Transport, USA

Normile, D. (2000), Taiwan: Academy head touted for top political post. *Science*, **287** (5461), 2127.

Full Text: [S\Science287, 2127.pdf](S/Science287,%202127.pdf)

Abstract: Focuses on the role of Lee Yuan-tseh in Academia Sinica, a group of research institutes in Taiwan. Information on the support extended by Lee to the candidacy of the winning president Chen Shui-bian, Rumor on the appointment of Lee as special envoy to Beijing, Contributions of Lee to the improvement of the academy.

Normile, D. (2000), Taiwan: Lee to remain as academy president. *Science*, **288** (5463), 28.

Full Text: [S\Science288, 28.pdf](S/Science288,%2028.pdf)

Abstract: Reports on the decision of Lee Yuan-tseh to remain at Taiwan’s Academia Sinica rather than join Taiwan’s administration. Lee’s endorsement of Chen Shui-bian for the presidential election in Taiwan held in March 18, 2000, Lee’s contribution to the Academia, Reaction of the Academia’s staff on Lee’s decision to remain.

Birgeneau, R.J. and Kastner, M.A. (2000), Frontier physics with correlated electrons. *Science*, **288** (5465), 437.

Full Text: [S\Science288, 437.pdf](S/Science288,%20437.pdf)

Abstract: Introduces a series of articles which deals with frontier physics and electrons.

Notes: highly cited

? Crowley, T.J. (2000), Causes of climate change over the past 1000 years. *Science*, **289** (5477), 270-277.

Full Text: [2000\Science289, 270.pdf](2000/Science289,%20270.pdf)

Notes: highly cited

? Vörösmarty, C.J., Green, P., Salisbury, J. and Lammers, R.B. (2000), Global water resources: Vulnerability from climate change and population growth. *Science*, **289** (5477), 284-288.

Full Text: [2000\Science289, 284.pdf](2000/Science289,%20284.pdf)

Abstract: The future adequacy of freshwater resources is difficult to assess, owing to a complex and rapidly changing geography of water supply and use. Numerical experiments combining climate model outputs, water budgets, and socioeconomic information along digitized river networks demonstrate that (i) a large proportion of the world's population is currently experiencing water stress and (ii) rising water demands greatly outweigh greenhouse warming in defining the state of global water systems to 2025. Consideration of direct human impacts on global water supply remains a poorly articulated but potentially important facet of the larger global change question.

Keywords: Scale

Ducor, P. (2000), Intellectual property: Coauthorship and coinventorship. *Science*, **289** (5481), 873-875.

Full Text: [S\Science289, 873.pdf](S/Science289,%20873.pdf)

Keywords: Authorship

Normile, D. (2001), Taiwan: Political spat delays funding for academy. *Science*, **291** (5503), 415.

Full Text: [S\Science291, 415.pdf](S/Science291,%20415.pdf)

Notes: highly cited

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Full Text: [2001\Science291, 1947.pdf](2001/Science291,%201947.pdf)

Abstract: Ultralong beltlike (or ribbonlike) nanostructures (so-called nanobelts) were successfully synthesized for semiconducting oxides of zinc, tin, indium, cadmium, and gallium by simply evaporating the desired commercial metal oxide powders at high temperatures, The as-synthesized oxide nanobelts are pure, structurally uniform, and single crystalline, and most of them are free from defects and dislocations. They have a rectanglelike cross section with typical widths of 30 to 300 nanometers, width-to-thickness ratios of 5 to 10, and Lengths of up to a few millimeters. The beltlike morphology appears to be a distinctive and common structural characteristic for the family of semiconducting oxides with cations of different valence states and materials of distinct crystallographic structures. The nanobelts could be an ideal system for fully understanding dimensionally confined transport phenomena in functional oxides and building functional devices along individual nanobelts.

Keywords: Cadmium, Carbon Nanotube, Growth, High-Temperature, Laser-Ablation, Metal, Nanowires, Nitride Nanorods, Transport, Wires

Notes: highly cited

? Wei, M.C., Zong, W.X., Cheng, E.H.Y., Lindsten, T., Panoutsakopoulou, V., Ross, A.J., Roth, K.A., MacCregor, G.R., Thompson, C.B. and Korsmeyer, S.J. (2001), Proapoptotic BAX and BAK: A requisite gateway to mitochondrial dysfunction and death. *Science*, **292** (5517), 727-730.

Full Text: [2001\Science292, 727.pdf](2001/Science292,%20727.pdf)

Koenig, R. (2001), Modeling a 3600-year-old tsunami sheds light on the Minoan past. *Science*, **293** (5533), 1252.

Full Text: [S\Science293, 1252.pdf](S/Science293,%201252.pdf)

Normile, D. (2001), Online science is a stretch for Asia. *Science*, **293** (5535), 1623.

Full Text: [S\Science293, 1623.pdf](S/Science293,%201623.pdf)

Abstract: Focuses on the introduction of online education in Universitas Terbuka and Sukhothai Thammathirat Open University in Asia. Consideration of online education as an economical alternative, Reasons on avoiding science and engineering courses in the universities, Difficulty and expense of providing for laboratory work.

Watson, A. (2001), UK research funding: Universities raise their game, but the money doesn’t flow. *Science*, **294** (5551), 2448-2449.

Full Text: [S\Science294, 2448.pdf](S/Science294,%202448.pdf)

Abstract: Presents a survey result on the performance of universities in science research in Great Britain. Shortage of the government funds for research, Criteria of judging the universities, Application of citation analysis in checking the survey result.

Normile, D. (2002), Taiwan: Frank Shu named university head. *Science*, **295** (5554), 429.

Full Text: [S\Science295, 429.pdf](S/Science295,%20429.pdf)

Abstract: Focuses on the appointment of Frank Shu as president of the National Tsinghua University in Hsinchu, Taiwan. Career background of Shu, Works on structure of spiral galaxies and star formation, Challenges in raising the quality of universities.

Notes: highly cited

? Locher, K.P., Lee, A.T. and Rees, D.C. (2002), The E-coli BtuCD structure: A framework for ABC transporter architecture and mechanism. *Science*, **296** (5570), 1091-1098.

Full Text: [2002\Science296, 1091.pdf](2002/Science296,%201091.pdf)

Abstract: The ABC transporters are ubiquitous membrane proteins that couple adenosine triphosphate (ATP) hydrolysis to the translocation of diverse substrates across cell membranes. Clinically relevant examples are associated with cystic fibrosis and with multidrug resistance of pathogenic bacteria and cancer cells. Here, we report the crystal structure at 3.2 angstrom resolution of the Escherichia coli BtuCD protein, an ABC transporter mediating vitamin B-12 uptake. The two ATP-binding cassettes (BtuD) are in close contact with each other, as are the two membrane-spanning subunits (BtuC); this arrangement is distinct from that observed for the E. coil lipid flippase MsbA. The BtuC subunits provide 20 transmembrane helices grouped around a translocation pathway that is closed to the cytoplasm by a gate region whereas the dimer arrangement of the BtuD subunits resembles the ATP-bound form of the Rad50 DNA repair enzyme. A prominent cytoplasmic loop of BtuC forms the contact region with the ATP-binding cassette and appears to represent a conserved motif among the ABC transporters.

Keywords: Atp-Binding-Cassette, Escherichia-Coli, Crystal-Structure, Cystic-Fibrosis, Multidrug-Resistance, P-Glycoprotein, Maltose Transport, Electron-Density, Active-Site, Proteins

? Smith, A.H., Lopipero, P.A., Bates, M.N. and Steinmaus, C.M. (2002), Public health - Arsenic epidemiology and drinking water standards. *Science*, **296** (5576), 2145-2146.

Full Text: [2002\Science296, 2145.pdf](2002/Science296,%202145.pdf)

Keywords: Cancer Risk Assessment, Disease Endemic Area, Malignant Neoplasms, Internal Cancers, Bladder-Cancer, Lung-Cancer, Well Water, Mortality, Taiwan, Methylation

Notes: highly cited

? Gabriel, S.B., Schaffner, S.F., Nguyen, H., Moore, J.M., Roy, J., Blumenstiel, B., Higgins, J., DeFelice, M., Lochner, A., Faggart, M., Liu-Cordero, S.N., Rotimi, C., Adeyemo, A., Cooper, R., Ward, R., Lander, E.S., Daly, M.J. and Altshuler, D. (2002), The structure of haplotype blocks in the human genome. *Science*, **296**, (5576), 2225-2229.

Full Text: [2002\Science296, 2225.pdf](2002/Science296,%202225.pdf)

Abstract: Haplotype-based methods offer a powerful approach to disease gene mapping, based on the association between causal mutations and the ancestral haplotypes on which they arose. As part of The SNP Consortium Allele Frequency Projects, we characterized haplotype patterns across 51 autosomal regions (spanning 13 megabases of the human genome) in samples from Africa, Europe, and Asia. We show that the human genome can be parsed objectively into haplotype blocks: sizable regions over which there is little evidence for historical recombination and within which only a few common haplotypes are observed. The boundaries of blocks and specific haplotypes they contain are highly correlated across populations. We demonstrate that such haplotype frameworks provide substantial statistical power in association studies of common genetic variation across each region. Our results provide a foundation for the construction of a haplotype map of the human genome, facilitating comprehensive genetic association studies of human disease.

Keywords: Human Lipoprotein-Lipase, Modern Human Origins, Linkage Disequilibrium, Sequence Variation, Crohns-Disease, Gene, Susceptibility, Complex, Identification, Mutation

Notes: highly cited

? Baughman, R.H., Zakhidov, A.A. and de Heer, W.A. (2002), Carbon nanotubes - the route toward applications. *Science*, **297** (5582), 787-792.

Full Text: [2002\Science297, 787.pdf](2002/Science297,%20787.pdf)

Abstract: Many potential applications have been proposed for carbon nanotubes, including conductive and high-strength composites, energy storage and energy conversion devices, sensors, field emission displays and radiation sources, hydrogen storage media, and nanometer-sized semiconductor devices, probes, and interconnects. Some of these applications are now realized in products. Others are demonstrated in early to advanced devices, and one, hydrogen storage, is clouded by controversy. Nanotube cost, polydispersity in nanotube type, and limitations in processing and assembly methods are important barriers for some applications of single-walled nanotubes.

Keywords: Arrays, Carbon, Electrical-Transport, Electronic-Properties, Field-Emission, Hydrogen, Hydrogen Storage, Junctions, Probe Microscopy, Ropes, Single-Wall, Superconductivity

Notes: highly cited

? Einsle, O., Tezcan, F.A., Andrade, S.L.A., Schmid, B., Yoshida, M., Howard, J.B. and Rees, D.C. (2002), Nitrogenase MoFe-protein at 1.16 angstrom resolution: A central ligand in the FeMo-cofactor. *Science*, **297** (5587), 1696-1700.

Full Text: [2002\Science297, 1696.pdf](2002/Science297,%201696.pdf)

Abstract: A high-resolution crystallographic analysis of the nitrogenase MoFe-protein reveals a previously unrecognized ligand coordinated to six iron atoms in the center of the catalytically essential FeMo-cofactor. The electron density for this ligand is masked in structures with resolutions lower than 1.55 angstroms, owing to Fourier series termination ripples from the surrounding iron and sulfur atoms in the cofactor. The central atom completes an approximate tetrahedral coordination for the six iron atoms, instead of the trigonal coordination proposed on the basis of lower resolution structures. The crystallographic refinement at 1.16 angstrom resolution is consistent with this newly detected component being a light element, most plausibly nitrogen. The presence of a nitrogen atom in the cofactor would have important implications for the mechanism of dinitrogen reduction by nitrogenase.

Keywords: Molybdenum-Iron Protein, Clostridium-Pasteurianum, Azotobacter-Vinelandii, Klebsiella-Pneumoniae, P-Cluster, Fixation, Models, System

Byerly, G.R., Lowe, D.R., Wooden, J.L. and Xie, X.G. (2002), An Archean impact layer from the Pilbara and Kaapvaal cratons. *Science*, **297** (5585), 1325-1327

Full Text: [S\Science297, 1325.pdf](S/Science297,%201325.pdf)

Abstract: The Barberton greenstone belt of South Africa and the eastern Pilbara block of Western Australia provide information about Earth’s surface environments between 3.2 and 3.5 billion years ago, including evidence for four large bolide impacts that likely created large craters, deformed the target rocks, and altered the environment. We have obtained identical single- zircon uranium-lead ages of 3470 +, - 2 million years ago for the oldest impact events from each craton. These deposits represent a single global fallout layer that is associated with sedimentation by an impact-generated tsunami and in Western Australia is represented by a major erosional unconformity.

Keywords: Barberton Greenstone-Belt, Microfossils, Mountain Land, Onverwacht, Record, Shocked Zircons, South-Africa, Spherules, Stratigraphy, Western-Australia

Notes: highly cited

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Keywords: Cdse Nanocrystals, Phase-Behavior, Mixtures, DNA

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Keywords: Adsorption, Carbon Nanotubes, Composition, Design, Hydrogen, Inelastic Neutron-Scattering, Metal-Organic Frameworks, Molecular-Hydrogen, Naphthalene, Rotation, Spectroscopy, Storage, Temperature, Uptake, USA, Zeolite Na-A, Zinc

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Keywords: Transmissible Gastroenteritis Coronavirus, Targeted Recombination, Membrane-Protein, Spike Gene, Virus, Determinant, Entry

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Keywords: Protein Families, RNA-Synthesis, Virus, Transcription, Database, Generation, Interpro, Sites

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Abstract: A novel coronavirus has been identified as the causative agent of severe acute respiratory syndrome (SARS). The viral main proteinase (M-pro, also called 3CL(pro)), which controls the activities of the coronavirus replication complex, is an attractive target for therapy. We determined crystal structures for human coronavirus (strain 229E) M-pro and for an inhibitor complex of porcine coronavirus [transmissible gastroenteritis virus (TGEV)] Mpro, and we constructed a homology model for SARS coronavirus (SARS-CoV) M-pro. The structures reveal a remarkable degree of conservation of the substrate-binding sites, which is further supported by recombinant SARS-CoV M-pro-mediated cleavage of a TGEV Mpro substrate. Molecular modeling suggests that available rhinovirus 3C(pro) inhibitors may be modified to make them useful for treating SARS.

Keywords: Virus-Encoded Proteinases, 229E 3C-Like Proteinase, Proteases

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Keywords: Oxide Composite Catalysts, Carbon-Monoxide, Total Oxidation, Oxygen, Kinetics, Methane

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Keywords: Separation

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Keywords: Cells, Challenge, Chronic, Diabetes, Disease, Failure, Growth, Health, Inflammation, Insulin, Investigation, Knowledge, Lead, Management, Obesity, Pathways, Protein, Receptor Substrate-2, Resistance, Signaling, Stimulates Tyrosine Phosphorylation, Synthesis

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Keywords: Biomass-Derived Hydrocarbons, Fuel-Cells, Oxidation, Catalysts, Alcohols

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Keywords: Growth-Factor Receptor, Tyrosine Kinase, BRAF Gene, Inhibitor, Sensitivity, Trial, Amplification, Combination, Paclitaxel, Efficacy

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Keywords: Carbon, Devices, Field, Graphene, Graphite, Induced, Nanotubes, Quality, Room Temperature

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Keywords: Activated Carbon, Adsorption, Carbon, Cavities, Chemistry, Coordination-Polymer, Crystal-Structure, Desorption, Desorption Kinetics, Gases, H2, Kinetics, Molecules, Network, Porosity, Sorption

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Keywords: Assessment, Biodiversity, Central-America, Climate, Disease, Frogs, Mortality, Population Declines, Toad

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Keywords: Alaska, Deformation, GPS, Hokkaido, Japan, Space, Strain Accumulation, Tokachi-Oki Earthquake, Trench

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Abstract: Nanomaterials are engineered structures with at least one dimension of 100 nanometers or less. These materials are increasingly being used for commercial purposes such as filters, opacifiers, catalysts, semiconductors, cosmetics, microelectronics, and drug carriers. Materials in this size range may approach the length scale at which some specific physical or chemical interactions with their environment can occur. As a result, their properties differ substantially from those bulk materials of the same composition, allowing them to perform exceptional feats of conductivity, reactivity, and optical sensitivity. Possible undesirable results of these capabilities are harmful interactions with biological systems and the environment, with the potential to generate toxicity. The establishment of principles and test procedures to ensure safe manufacture and use of nanomaterials in the marketplace is urgently required and achievable.

Keywords: Induce Oxidative Stress, Wall Carbon Nanotubes, Ultrafine Particles, Pulmonary Toxicity, Inhaled Ultrafine, Air-Pollution, Nanotoxicology, Translocation, Nanoparticles, Nanomaterials

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Abstract: The increasing worldwide contamination of freshwater systems with thousands of industrial and natural chemical compounds is one of the key environmental problems facing humanity. Although most of these compounds are present at low concentrations, many of them raise considerable toxicological concerns, particularly when present as components of complex mixtures. Here we review three scientific challenges in addressing water-quality problems caused by such micropollutants. First, tools to assess the impact of these pollutants on aquatic life and human health must be further developed and refined. Second, cost-effective and appropriate remediation and water-treatment technologies must be explored and implemented. Third, usage and disposal strategies, coupled with the search for environmentally more benign products and processes, should aim to minimize introduction of critical pollutants into the aquatic environment.

Keywords: Surface Waters, Waste-Water, Risk-Assessment, Human Health, Environment, Ecotoxicology, Contaminants, Pharmaceuticals, Transformation, Oxidation

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Abstract: Increasing energy use, climate change, and carbon dioxide (CO2) emissions from fossil fuels make switching to low- carbon fuels a high priority. Biofuels are a potential low- carbon energy source, but whether biofuels offer carbon savings depends on how they are produced. Converting rainforests, peatlands, savannas, or grasslands to produce food crop - based biofuels in Brazil, Southeast Asia, and the United States creates a “biofuel carbon debt” by releasing 17 to 420 times more CO2 than the annual greenhouse gas (GHG) reductions that these biofuels would provide by displacing fossil fuels. In contrast, biofuels made from waste biomass or from biomass grown on degraded and abandoned agricultural lands planted with perennials incur little or no carbon debt and can offer immediate and sustained GHG advantages.

Keywords: Climate Policy, Switchgrass, Conservation, Amazon, Legume, Fuel

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Abstract: Minerals are more complex than previously thought because of the discovery that their chemical properties vary as a function of particle size when smaller, in at least one dimension, than a few nanometers, to perhaps as much as several tens of nanometers. These variations are most likely due, at least in part, to differences in surface and near- surface atomic structure, as well as crystal shape and surface topography as a function of size in this smallest of size regimes. It has now been established that these variations may make a difference in important geochemical and biogeochemical reactions and kinetics. This recognition is broadening and enriching our view of how minerals influence the hydrosphere, pedosphere, biosphere, and atmosphere.

Keywords: Colloidal Iron, Ultrafine Particles, Mars Pathfinder, North-Atlantic, Size, Transport, Cycle, Sea, Nanodiamonds, Ferrihydrite

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Keywords: Citations, Deja-Vu, Medline, Plagiarism

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Full Text: [2009\Science324, 1004.pdf](2009/Science324,%201004.pdf)

Keywords: Plagiarism

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Full Text: 2009\Science325, 813.pdf

Full Text: [2009\Science325, 813.pdf](2009/Science325,%20813.pdf)

Keywords: Plagiarism

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Full Text: [2009\Science325, 813.pdf](2009/Science325,%20813.pdf)

Keywords: Plagiarism, Science

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Full Text: [2010\Science328, 1228.pdf](2010/Science328,%201228.pdf)

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Full Text: [2011\Science333, 1015.pdf](2011/Science333,%201015.pdf)

Abstract: We investigated the association between a U. S. National Institutes of Health (NIH) R01 applicant’s self-identified race or ethnicity and the probability of receiving an award by using data from the NIH IMPAC II grant database, the Thomson Reuters Web of Science, and other sources. Although proposals with strong priority scores were equally likely to be funded regardless of race, we find that Asians are 4 percentage points and black or African-American applicants are 13 percentage points less likely to receive NIH investigator-initiated research funding compared with whites. After controlling for the applicant’s educational background, country of origin, training, previous research awards, publication record, and employer characteristics, we find that black applicants remain 10 percentage points less likely than whites to be awarded NIH research funding. Our results suggest some leverage points for policy intervention.

Keywords: African American, Ethnicity, Funding, Health, Intervention, NIH, Points, Policy, Publication, Race, Research, Science, Thomson Reuters, Training, Web of Science

# Title: Science China-Chemistry

Full Journal Title: Science China-Chemistry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Xu, X., Gao, Y., Gao, B.Y., Yue, Q.Y. and Zhong, Q.Q. (2010), Adsorption studies of the removal of anions from aqueous solutions onto an adsorbent prepared from wheat straw. *Science China-Chemistry*, **53** (6), 1414-1419.

Full Text: [2010\Sci Chi-Che53, 1414.pdf](2010/Sci%20Chi-Che53,%201414.pdf)

Abstract: Modified wheat straw (MWS) was prepared by the grafting of epichlorohydrin, triethylamine and ethylenediamine onto WS. The characteristics of MWS and its adsorption capacity for NO3-, PO43- and Cr2O72-. were investigated. The results indicate that amine groups with positive charge have been introduced into the structure of MWS, and significantly increased its anion ad-sorption property. The functions of MWS dosage, the solution pH, the contact time and temperature have significant influence on the adsorption process, and the adsorption is well fitted with the Langmuir equation and pseudo second-order model. The maximum adsorption capacity of MWS for NO3-, PO43-. (P) and Cr2O72-. (Cr) is 53.5, 62.4 and 386.2 mg g-1, respectively.

Keywords: Acid, Adsorbent, Adsorption, Anion, Dyes, Ion-Exchange, Langmuir, Maximum Adsorption Capacity, Nitrate, Residue, Wheat Straw

? Qian, L.J., Hu, P.Z., Jiang, Z.J., Geng, Y.X. and Wu, W.S. (2010), Effect of pH, fulvic acid and temperature on the sorption of uranyl on ZrP2O7. *Science China-Chemistry*, **53** (6), 1429-1437.

Full Text: [2010\Sci Chi-Che53, 1429.pdf](2010/Sci%20Chi-Che53,%201429.pdf)

Abstract: The sorption of UO22+ onto ZrP2O7 was studied using the batch technique and the point of zero charge of ZrP2O7 was obtained through mass titration. The results indicated that sorption of UO22+ onto ZrP2O7 was strongly affected by pH, solid-to-liquid ratio (m/V), the species of electrolyte in solution and fulvic acid (FA), but was insensitive to ionic strength. The sorption of UO22+ increased with increasing pH and m/V. The presence of FA enhanced UO22+ sorption onto ZrP2O7 at low pH. The presence of phosphate or sulfate caused opposite effects on the sorption of UO22+ onto ZrP2O7. Addition of citrate also significantly affected UO22+ sorption. The sorption of UO22+ increased as the temperature of the system increased. The Langmuir and Freundlich models were used to simulate the sorption isotherms of UO22+ onto ZrP2O7 at different temperatures. The results indicated that the Freundlich model described UO22+ sorption better than the Langmuir model. Thermodynamic parameters for the sorption process were calculated from the temperature dependent sorption isotherms. The results suggested that the sorption process of UO22+ onto ZrP2O7 is spontaneous and endothermic. The desorption process of UO22+ from ZrP2O7 was also investigated and it was found that sorption onto ZrP2O7 was irreversible.

Keywords: Batch, Contact Time, Desorption, Diphosphate, Eu(III), Ionic-Strength, Isotherms, Langmuir, Low, Phosphate, Phosphate-Compounds, Solution Interface, Sorption, Thermodynamic, Thermodynamic Data, Uranium(VI), Uranyl, XPS, Zirconium, ZrP2O7

? Wang, X.F., Shi, K.L., Guo, Z.J. and Wu, W.S. (2010), Eu(III) adsorption on rutile: Batch experiments and modeling. *Science China-Chemistry*, **53** (12), 2628-2636.

Full Text: [2010\Sci Chi Che53, 2628.pdf](2010/Sci%20Chi%20Che53,%202628.pdf)

Abstract: Eu(III) adsorption on rutile was investigated as a function of contact time, pH, ionic strength and Eu(III) concentration by using a batch experimental method. The effects of carbonate, sulfate, and phosphate were also studied. It was found that the kinetics of Eu(III) adsorption on rutile could be described by a pseudo-second-order model. The adsorption of Eu(III) on rutile is strongly pH-dependent, but relatively insensitive to ionic strength. A double layer model (DLM) with two inner-sphere Eu(III) surface complexes was applied to quantitatively interpret the adsorption of Eu(III) on rutile. There were no apparent effects of carbonate and sulfate on Eu(III) adsorption, whereas the presence of phosphate promoted Eu(III) adsorption on rutile. The surface complexes of Eu(III) on rutile were evidenced by X-ray photoelectron spectroscopy (XPS).

Keywords: 250-º-C, Adsorption, Aqueous-Solutions, Batch, Carbonate, Concentration, Eu(III), Europium, Experimental, Experiments, Function, Ionic Strength, Ionic-Strength, Kinetics, Model, Modeling, pH, pH-Dependent, Phosphate, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rutile, Sorption, Spectroscopy, Strength, Sulfate, Surface, Surface Complexation, Surface Complexes, TiO2 Anatase, Water Interface, X-Ray, X-Ray Photoelectron Spectroscopy, XPS

? Xie, H.J., Liu, W.F., Zhang, J., Zhang, C.L. and Ren, L. (2011), Sorption of norfloxacin from aqueous solutions by activated carbon developed from *Trapa natans* husk. *Science China-Chemistry*, **54** (5), 835-843.

Full Text: [2011\Sci Chi-Che54, 835.pdf](2011/Sci%20Chi-Che54,%20835.pdf)

Abstract: The low-cost activated carbon was prepared from a renewable aquatic plant residue, Trapa natans husk, and tested for its ability to remove norfloxacin (NOR) from aqueous solutions. Physical and chemical properties of the Trapa natans husk activated carbon (TAC) were characterized. TAC has a large surface area of 1274 m2/g and mesoporous structure. Carboxylic and hydroxyl groups contributed to the sorption of NOR onto TAC but they were not the most important factors in the sorption process. The rates of adsorption followed the pseudo-second-order kinetics and the overall rate of NOR uptake was controlled by both external mass transfer and intro particle diffusion during the entire adsorption period. The equilibrium data fitted well with the Freundlich and Tempkin models and the sorption was found to be a favorable process. The adsorption of NOR by TAC was strongly dependent on the solution pH. Electrostatic interaction and hydrophobic interaction were proposed to be the principal NOR sorption mechanism.

Keywords: Activated Carbon, Adsorption, Adsorption, Antimicrobials, Behavior, Diffusion, Environment, Equilibrium, Fluoroquinolone Antibacterial Agents, Freundlich, Kinetic and Isotherms, Kinetics, Mechanism, Mechanisms, Norfloxacin, pH, Sorption, Temperature, Tempkin, Trapa Natans Husk, Uptake

# Title: Science China-Physics Mechanics & Astronomy

Full Journal Title: [Science China-Physics Mechanics & Astronomy](http://www.springerlink.com/content/v26522712677/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1674-7348

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Zheng, Y.N., Yuan, J.P., Pan, Y.T. and Zhao, X.Y. (2011), Scientometric analysis of physics (1979-2008): A quantitative description of scientific impact. *Science China-Physics Mechanics & Astronomy*, **54** (1), 176-182.

Full Text: [2011\Sci Chi-Phy Mec Ast54, 176.pdf](2011/Sci%20Chi-Phy%20Mec%20Ast54,%20176.pdf)

Abstract: Citations are a way to show how researchers build on existing research to further evolve research. The citation count is an indication of the influence of specific articles. The importance of citations means that it is valuable to analyze the articles that are cited the most. This research investigates highly-cited articles in physics (1979-2008) using citation data from the ISI Web of Science. In this study, 1544205 articles were examined. The objective of the analysis was to identify and list the highly-productive countries, institutions, authors, and fields in physics. Based on the analysis, it was found that the USA is the world leader in physics, and Japan has maintained the highest growth rate in physics research since 1990. Furthermore, the research focus at Bell Labs and IBM has played important roles in physics. A striking fact is that the five most active authors are all Japanese, but the five most active institutions are all in the USA. In fact, only The University of Tokyo is ranked among the top 11 institutions, and only American authors have single-author articles ranked among the top 19 articles. The highest-impact articles are distributed across 25 subjects categories. Physics, Multidisciplinary has 424 articles, and is ranked at No. 1 in total articles, followed by Physics, Condensed Matter. The study can provide science policy makers with a picture of innovation capability in this field and help them make better decisions. Hopefully, this study will stimulate useful discussion among scientists and research managers about future research directions.

Keywords: Analysis, Authors, Citation, Citations, Cited Articles, Data, Distributed, Domestic Articles, Field, Growth, Growth Rate, High-Impact Articles, Impact, Indication, Innovation, Institutions, International Articles, ISI, ISI Web of Science, Japan, Policy, Research, Research Output, Science, Science Policy, Scientific Impact, Social Network Analysis, USA, Web of Science, World

# Title: Science in China Series A-Mathematics Physics Astronomy

Full Journal Title: [Science in China Series A-Mathematics Physics Astronomy](http://www.scichina.com/contents/yk/ya/)

ISO Abbreviated Title: Sci. China Ser. A-Math. Phys. Astron.

JCR Abbreviated Title: Sci China Ser A

ISSN: 1006-9283

Issues/Year: 12

Journal Country Peoples R China

Language: English

Publisher: Science Press

Publisher Address: 16 Donghuangchenggen North St, Beijing 100717, Peoples R China

Subject Categories:

Multidisciplinary Sciences: Impact Factor

# Title: Science in China Series B-Chemistry

Full Journal Title: [Science in China Series B-Chemistry](http://219.238.6.200/journal?code=04), [Science in China Series B-Chemistry](http://e42.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=JBXG&NaviLink=Science%20in%20China,Ser.B)

ISO Abbreviated Title: Sci. China Ser. B-Chem.

JCR Abbreviated Title: Sci China Ser B

ISSN: 1006-9291

Issues/Year: 6

Journal Country Peoples R China

Language: Multi-Language

Publisher: Science Press

Publisher Address: 16 Donghuangchenggen North St, Beijing 100717, Peoples R China

Subject Categories:

Chemistry, Multidisciplinary: Impact Factor 0.648, 61/121 (1999), Impact Factor 0.702, 63/119 (2002), Impact Factor 0.817, 68/125 (2004), Impact Factor 0.650, 82/125 (2005)

Wang, R.S., Cheng, H. and Wang, L.P. (1994), Physicochemical behavior and removal of lead in water. *Science in China Series B-Chemistry*, **37**, 1429-1437.

Full Text: Sci Chi Ser B-Che37, 1429.pdf

Abstract: A new ionic sieve has been prepared in a process of saturating a substrate with Pb (Ac)2 solution followed by thermodynamic recrystallization. The substrate is silica gel on which beta-type titanium is introduced. The ionic sieve possesses a specific selectivity for Pb(II) ions in the aqueous solution with multicomponent composition. The aquatic chemistry of Pb(II), the amphoteric surface of the ionic sieve and the behaviour of Pb(II) at the solid-liquid interface are discussed. The ionic sieve can be used to remove lead from various aquatic systems.

? Yang, L., Jia, L.Y., Zou, H.F., Zhou, D.M. and Zhang, Y.K. (1998), Immobilized metal affinity composite membrane based on cellulose for separation of biopolymers. *Science in China Series B-Chemistry*, **41** (6), 596-605.

Full Text: Sci Chi Ser B-Che41, 596.pdf

Abstract: A new iminodiacetic acid (IDA) type chelating membrane based on composite matrix formed by covalently coupling the polyglycidyl methacrylate to cotton cellulose fiber was developed. The study focused on the optimal conditions for the preparation of the membrane and the reaction of the chelating agent (iminodiacetic acid, IDA) with the matrix. The physical properties of the chelating membrane were tested by electron micrography and BET surface area instrument. The relationship between flow-rate and backpressure was almost linear. Adsorption isotherm of protein on Cu2+ - IDA membrane was determined by batch experiments. The dissociation constants and the maximum adsorption capacity were obtained. The results of affinity purification of human serum albumin and bovine liver catalase on membrane are comparable with those on gel chromatography presented in literature. The separations performed on the membrane chromatography, however, were 3-5 times faster than those on gel chromatography. The immobilized metal composite membrane was also successfully used in HPLC for rapid analysis of protein. Thus, the composite membrane reported here, with low backpressure, low cost and long service-life, is quite suitable for rapid and large scale affinity purification and HPLC analysis of biopolymers

Keywords: Adsorption, Affinity Chromatography, Biopolymers, Chromatography, Matrix, Membrane, Proteins, Purification, Separation

Liao, X.P., Lu, Z.B. and Shi, B. (2003), Selective adsorption of tannins onto hide collagen fibres. *Science in China Series B-Chemistry*, **46** (5), 495-504.

Full Text: [S\Sci Chi Ser B46, 495.pdf](S/Sci%20Chi%20Ser%20B46,%20495.pdf)

Abstract: Hide collagen of animals is used to prepare adsorbent material and its adsorption properties to tannins are investigated. It is indicated that the collagen fibres has excellent adsorption selectivity and high adsorption capacity to tannins. The adsorption rate of tannins is more than 90% whilst less than 10% of functional components are retained by the adsorbent. The adsorption mechanism of tannins onto hide collagen fibres is hydrogen-bonding association. Freundlich model can be used to describe the adsorption isotherms, and the pseudo-second-order rate model can be used to describe adsorption kinetics.

Keywords: Vegetable Tannin, Plant Medicine, Hide Collagen Fibres, Adsorption Selectivity, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solutions

? Ho, Y.S. (2005), Comment on ‘Selective adsorption of tannins onto hide collagen fibres’. *Science in China Series B-Chemistry*, **48** (2), 176.

Full Text: [S\Sci Chi Ser B48, 176.pdf](S/Sci%20Chi%20Ser%20B48,%20176.pdf)

Keywords: Aqueous-Solution, Sorption

# Title: Science in China Series C-Life Sciences

Full Journal Title: [Science in China Series C-Life Sciences](http://www.scichina.com/contents/yk/yc/)

ISO Abbreviated Title: Sci. China Ser. C-Life Sci.

JCR Abbreviated Title: Sci China Ser C

ISSN: 1006-9305

Issues/Year: 6

Journal Country Peoples R China

Language: English

Publisher: Science Press

Publisher Address: 16 Donghuangchenggen North St, Beijing 100717, Peoples R China

Subject Categories:

Biology: Impact Factor

# Title: Science in China Series D-Earth Sciences

Full Journal Title: [Science in China Series D-Earth Sciences](http://www.scichina.com/contents/yk/yd/)

ISO Abbreviated Title: Sci. China Ser. D-Earth Sci.

JCR Abbreviated Title: Sci China Ser D

ISSN: 1006-9313

Issues/Year: 6

Journal Country Peoples R China

Language: English

Publisher: Science Press

Publisher Address: 16 Donghuangchenggen North St, Beijing 100717, Peoples R China

Subject Categories:

Geosciences, Interdisciplinary: Impact Factor

? Liao, L.B. and Fraser, D.G. (2005), Adsorption of As on hydroxy-Fe-montmorillonite complexes. *Science in China Series D-Earth Sciences*, **48** (12), 2155-2165.

Abstract: Arsenate has high affinity for soluble hydroxy-Fe species and Fe-oxyhydroxide precipitates. In addition, the hydrolysis of Fe(III) and the growth of the initially precipitated Fe(III) phases are strongly influenced by the presence of montmorillonite. In this paper, the adsorption of As onto various hydroxy-Fe-montmorillonite (H-F-M) complexes was studied. Three systems of samples were prepared by mixing montmorillonite, hydroxy-Fe and arsenate in different sequences: (1) Prior mixing of montmorillonite and hydroxy-Fe before the addition of arsenate, (2) prior mixing of hydroxy-Fe and arsenate before the addition of montmorilionite, and (3) prior mixing of montmorillonite and arsenate before the addition of hydroxy-Fe. For each system, the effects of pH, ionic strength, temperature, initial Fe and As concentrations and adsorption duration on the overall uptake of As by H-F-M complexes were studied. Results showed that the uptake of As increased with increasing pH, temperature, initial Fe concentration and adsorption duration, and decreased with increasing ionic strength and initial As concentration to different extents for the three systems. The variation of the As uptake of H-F-M complexes with pH in the range of study is opposite to that reported previously for Fe-O-H systems in the absence of montmorillonite and similar to that reported for montmorillonite in the absence of hydroxy-Fe. The marked influence of ionic strength on the As uptake of H-F-M complexes indicates that outer-sphere complexation plays an important role. This is quite different from the adsorption of As on the surface of either Fe-oxyhydroxides or montmorillonite alone in which inner-sphere complexation dominates. Under all experimental conditions, the H-F-M complexes studied displayed a very strong affinity for As, among which system 2 had the highest As adsorption capacity and system 1 the lowest. The authors attribute this to the differences in mixing sequence which resulted in more hydroxy-Fe (the main adsorbent for As) in system 1 adsorbing onto montmorillonite before adsorbing As than in systems 2 or 3.

Keywords: Adsorption, Adsorption Capacity, Arsenate, Arsenate Adsorption, Clay, Colloidal Particles, Complex, Exafs, Hydrolysis, Hydroxy-Fe, Iron(III), Mechanism, Montmorillonite, Oxyhydroxide, Phosphate

# Title: Science in China Series E-Technological Sciences

Full Journal Title: [Science in China Series E-Technological Sciences](http://www.scichina.com/contents/yk/ye/)

ISO Abbreviated Title: Sci. China Ser. E-Technol. Sci.

JCR Abbreviated Title: Sci China Ser E

ISSN: 1006-9321

Issues/Year: 6

Journal Country Peoples R China

Language: English

Publisher: Science Press

Publisher Address: 16 Donghuangchenggen North St, Beijing 100717, Peoples R China

Subject Categories:

Engineering Materials Science: Impact Factor

? Shen, Y.M., Li, Y.C. and Chwang, A.T. (1996), Quasi 3 dimensional refined modeling of turbulent flow and water quality in coastal waters. *Science in China Series E-Technological Sciences*, **39**, 342-353.

Full Text: Sci Chi Ser E-Tec Sci39, 342.pdf

Abstract: The water quality in Victoria Harbour, Hong Kong is dominated by strong seasonal effects resulting from the variation in freshwater discharge into the Pearl Estuary. the quasi-three-dimensional water quality model has been developed to simulate the variations in water quality and the ecosystem in the harbour. The model is unique in that it completely integrates the refined modelling of the hydrodynamics, biochemical reactions and the ecosystem in the harbour. It is a quasi-three-dimensional segmented model which is capable of resolving mean daily variations in all the parameters relevant to pollution control. It predicts daily fluctuations in the oxygen content of different depths in water throughout the year. It takes into account transport and settling of pollutant particles. It predicts light penetration from computed turbidity variations. It includes interactions between the ecosystem and water quality, through nutrient cycling and photosynthesis. The model has been calibrated well against the data set of historical water quality observations.

? Long, X.Y., Luo, X.G., Wang, Y. and Li, Z. (2009), Sorption of Pb(II) from aqueous solution by konjac glucomannan beads. *Science in China Series E-Technological Sciences*, **52** (1), 223-226.

Full Text: [2009\Sci Chi Ser E-Tec Sci52, 223.pdf](2009/Sci%20Chi%20Ser%20E-Tec%20Sci52,%20223.pdf)

Abstract: Konjac glucomannan beads have been investigated as metal biosorbent for Pb(II) from aqueous solutions. The effect of contact time, solution pH, initial metal concentration, and desorption were studied in batch experiments at 20°C±2°C. Maximum mental sorption was found to occur at initial pH 4.0-5.5. Kinetic studies revealed that the initial uptake was rapid and equilibrium was established in 3 h and that the data followed the prseudo-second order reaction. The equilibrium sorption data at initial pH 4.0 were described by the Langmuir and Freundlich isotherm models, however, Langmuir isotherm model has been found to provide the best correlation. The highest value of Langmuir maximum uptake (q(max)) was found to be 105.71 mg . g-1. Similar Freundlich empirical constant (KF) was obtained to be 1.98 for lead. Adsorption-complexation may be involved in the sorption process of lead. Desorption experiments showed evidence that after two contacts neither HCl nor EDTA solutions were able to desorb lead from the konjac glucomannan beads, but the desorbtion efficacy of HCl solution was higher than EDTA solution. The results obtained show that konjac glucomannan beads may be used for the treatment of wastewater contaminated with lead.

Keywords: Adsorption, Aqueous Solution, Aqueous Solutions, Batch, Batch Experiments, Beads, Biosorbent, Biosorption, Concentration, Contact, Correlation, Data, Desorption, EDTA, Efficacy, Equilibrium, Evidence, Experiments, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Isotherm, Isotherm Model, Isotherm Models, Kinetic, Kinetic Studies, Konjac Glucomannan, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Lead, Metal, Model, Models, Pb(II), pH, Phenol, Process, Solution, Solutions, Sorption, Sorption Process, Treatment, Uptake, Value, Wastewater

# Title: Science Communication

Full Journal Title: [Science Communication](http://uk1.csa.com/ids70/browse_toc.php?SID=727f8201daa75ffa83e6c6d1180e303b&db=sagecom-set-c&docid=sage-set-c%2FSCX_2005_27_2indx_cln3.wais+0+sagecom-set-c), [Science Communication](http://scx.sagepub.com/)

ISO Abbreviated Title: Sci. Commun.

JCR Abbreviated Title: Sci Commun

ISSN: 1075-5470

Issues/Year: 4

Journal Country United States

Language: English

Publisher: Sage Publications Inc

Publisher Address: 2455 Teller Rd, Thousand Oaks, CA 91320

Subject Categories:

Communication: Impact Factor 0.476, / (2002) SSCI

? Evans, W. (2001), Mapping mainstream and fringe medicine on the Internet. *Science Communication*, **22** (3), 292-299.

Full Text: [2001\Sci Com22, 292.pdf](2001/Sci%20Com22,%20292.pdf)

Abstract: This report describes a system that monitors Internet discussion groups and Web sires for evidence that public interest bt herbal remedies is outpacing the available scientific evidence regarding herbal remedies. Using content analysis and bibliometric techniques, this system can identify emerging unorthodox practices and beliefs related to health and medicine. In addition. this System can map the diffusion of health-related claims across Internet communities.

Keywords: Information

# Title: Science and Engineering Ethics

Full Journal Title: [Science and Engineering Ethics](http://www.springerlink.com/content/120482/)

ISO Abbrev. Title: Sci. Eng. Ethics

JCR Abbrev. Title: Sci Eng Ethics

ISSN: 1353-3452

Issues/Year: 4

Language: English

Journal Country/Territory: Netherlands

Publisher: Springer

Publisher Address: Van Godewijckstraat 30, 3311 GZ Dordrecht, Netherlands

Subject Categories:

Engineering, Multidisciplinary: Impact Factor 0.563, 41/68 (2008), Impact Factor 0.913, 35/79 (2009)

History & Philosophy of Science: Impact Factor 0.563, 14/41 (2008), Impact Factor 0.913, 8/45 (2009)

Multidisciplinary Sciences: Impact Factor 0.563, 25/42 (2008), Impact Factor 0.913, 20/50 (2009)

? Thomsen, M. and Resnik, D. (1995), The effectiveness of the erratum in avoiding error propagation in physics. *Science and Engineering Ethics*, **1** (3), 231-240.

Full Text: [1995\Sci Eng Eth1, 231.pdf](1995/Sci%20Eng%20Eth1,%20231.pdf)

Abstract: The propagation of errors in physics research is studied, with particular attention being paid to the effectiveness of the erratum in avoiding error propagation. We study the citation history of 17 physics papers which have significant errata associated with them. It would appear that the existence of an erratum does not significantly decrease the frequency with which a paper is cited and in most cases the erratum is not cited along with the original paper. The authors comment on implications for the responsibilities of authors.

Krimsky, S. and Rothenberg, L.S. (2001), Conflict of interest policies in science and medical journals: Editorial practices and author disclosures. *Science and Engineering Ethics*, **7** (2), 205-218.

Full Text: [2001\Sci Eng Eth7, 205.pdf](2001/Sci%20Eng%20Eth7,%20205.pdf)

Abstract: This study examines the extent to which scientific and biomedical journals have adopted conflict of interest (COI) policies for authors, and whether the adoption and content of such policies leads to the publishing of authors’ financial interest disclosure statements by such journals. In particular, it reports the results of a survey of journal editors about their practices regarding COI disclosures. About 16 percent of 1396 highly ranked scientific and biomedical journals had COI policies in effect during 1997. Less than 1 percent of the articles published during that year in the journals with COI policies contained any disclosures of author personal financial interests while nearly 66 percent of the journals had zero disclosures of author personal financial interests. Nearly three fourths of journal editors surveyed usually publish author disclosure statements suggesting that low rates of personal financial disclosures are either a result of low rates of author financial interest in the subject matter of their publications or poor compliance by authors to the journals’ COI policies.

Keywords: Conflict of Interests, Financial Disclosure, Scientists, Scientific Literature, Editors

? Bird, S.J. (2002), Self-plagiarism and dual and redundant publications: What is the problem? Commentary on ‘seven ways to plagiarize: Handling real allegations of research misconduct’. *Science and Engineering Ethics*, **8** (4), 543-544.

Full Text: [2002\Sci Eng Eth8, 543.pdf](2002/Sci%20Eng%20Eth8,%20543.pdf)

Keywords: Dual Publication, Publications, Research, Self-Plagiarism

? Marušić, M., Božikov, J., Katavić, V., Hren, D., Kljaković-Gašpić, M. and Marušić, A. (2004), Authorship in a small medical journal: A study of contributorship statements by corresponding authors. *Science and Engineering Ethics*, **10** (3), 493-502.

Full Text: [2004\Sci Eng Eth10, 493.pdf](2004/Sci%20Eng%20Eth10,%20493.pdf)

Abstract: The authorship criteria of the International Committee of Medical Journal Editors (ICMJE) are widely accepted in biomedical journals, but many studies in large and prestigious journals show that a considerable proportion of authors do not fulfill these criteria. We investigated authorship. contributions in a small medical journal outside the scientific mainstream, to see if poor adherence to authorship criteria is common in biomedical journals. We analyzed statements on research contribution, as checked by the corresponding author, for individual authors of 114 research articles, representing 475 authors, submitted to the Croatian Medical Journal (CMJ) from 1999 to 2000. Only 40% of authors fulfilled the ICMJE authorship criteria. The authors listed first on the by-line were more likely to fulfill the authorship criteria than all other authors on the by-line. The percentage of authors fulfilling the ICMJE criteria of authorship decreased with the increase in the number of authors listed on the by-line. These results indicate that poor adherence to ICMJE authorship criteria is poor across biomedical journals, regardless of the size of the scientific community. Authorship and contributorship in biomedical journals, as well as editorial ethical responsibilities towards authorship criteria need critical redefinition and education of both editors and authors.

Keywords: Author, Authorship, Contribution, Credit, Criteria, Ethics, Journals, Order, Publications, Research, Research Articles, Researcher Contributions, Science

? Sheskin, T.J. (2006), An analytic hierarchy process model to apportion co-author responsibility. *Science and Engineering Ethics*, **12** (3), 555-565.

Full Text: [2006\Sci Eng Eth12, 555.pdf](2006/Sci%20Eng%20Eth12,%20555.pdf)

Abstract: The analytic hierarchy process (AHP) can be used to determine coauthor responsibility for a scientific paper describing collaborative research. The objective is to deter scientific fraud by holding co-authors accountable for their individual contributions. A hiearchical model of the research presented in a paper can be created by dividing it into primary and secondary elements. The co-authors then determine the contributions of the primary and secondary elements to the work as a whole as well as their own individual contributions. They can use the results to determine authorship order.

Keywords: Analytic, Authorship, Co-Author, Fraud, Hierarchy, Model, Primary, Process, Research, Responsibility

? Neale, A.V., Northrup, J., Dailey, R., Marks, E. and Abrams, J. (2007), Correction and use of biomedical literature affected by scientific misconduct. *Science and Engineering Ethics*, **13** (1), 5-24.

Full Text: [2007\Sci Eng Eth13, 5.pdf](2007/Sci%20Eng%20Eth13,%205.pdf)

Abstract: The purpose of this study was to identify and describe published research articles that were named in official findings of scientific misconduct and to investigate compliance with the administrative actions contained in these reports for corrections and retractions, as represented in PubMed. Between 1993 and 2001, 102 articles were named in either the NIH Guide for Grants and Contracts (“Findings of Scientific Misconduct”) or the U. S. Office of Research Integrity annual reports as needing retraction or correction. In 2002, 98 of the 102 articles were indexed in PubMed. Eighty-five of these 98 articles had indexed corrections: 47 were retracted, 26 had an erratum, 12 had a correction described in the “comment” field. Thirteen had no correction, but 10 were linked to the NIH Guide “Findings of Scientific Misconduct”, leaving only 3 articles with no indication of any sort of problem. As of May 2005, there were 5,393 citations to the 102 articles, with a median of 26 citations per article (range 0-592). Researchers should be alert to “Comments” linked to the NIHGuide as these are open access, and the “Findings of Scientific Misconduct” reports are often more informative than the statements about the retraction or correction found in the journals.

Keywords: Access, Acute Myeloid-Leukemia, Bibliometric Analysis, Biomedical, Biomedical Publishing, Citations, Field, Hamster Gustatory Cortex, Indication, Journals, Literature, Migration-Inhibitory Factor, Myosin Heavy-Chain, Open Access, Protein Kinase-C, Publication Ethics, Pubmed, Rat Optic-Nerve, Research, Retracted Article. See, Retraction of Publication, Scientific Misconduct, Sodium-Channels, Status Group Members, Suppressor T-Cells

? Golubic, R., Rudes, M., Kovacic, N., Marusic, M. and Marusic, A. (2008), Calculating impact factor: How bibliographical classification of journal items affects the impact factor of large and small journals. *Science and Engineering Ethics*, **14** (1), 41-49.

Full Text: [2008\Sci Eng Eth14, 41.pdf](2008/Sci%20Eng%20Eth14,%2041.pdf)

Abstract: As bibliographical classification of published journal items affects the denominator in this equation, we investigated how the numerator and denominator of the impact factor (IF) equation were generated for representative journals in two categories of the Journal Citation Reports (JCR). We performed a full text search of the 1st-ranked journal in 2004 JCR category “Medicine, General and Internal” (New England Journal of Medicine, NEJM, IF = 38.570) and 61st-ranked journal (Croatian Medical Journal, CMJ, IF = 0.690), 1st-ranked journal in category “Multidisciplinary Sciences” (Nature, IF = 32.182) and journal with a relative rank of CMJ (Anais da Academia Brasileira de Ciencias, AABC, IF = 0.435). Large journals published more items categorized by Web of Science (WoS) as non-research items (editorial material, letters, news, book reviews, bibliographical items, or corrections): 63% out of total 5,193 items in Nature and 81% out of 3,540 items in NEJM, compared with 31% out of 283 items in CMJ and only 2 (2%) out of 126 items in AABC. Some items classified by WoS as non-original contained original research data (9.5% in Nature, 7.2% in NEJM, 13.7% in CMJ and none in AABC). These items received a significant number of citations: 6.9% of total citations in Nature, 14.7% in NEJM and 18.5% in CMJ. IF decreased for all journals when only items presenting original research and citations to them were used for IF calculation. Regardless of the journal’s size or discipline, publication of non-original research and its classification by the bibliographical database have an effect on both numerator and denominator of the IF equation.

Keywords: Journal, Impact Factor, Bibliographical Database, Indexing, Science, Quality

? Foo, J.Y.A. (2009), A study on journal self-citations and intra-citing within the subject category of multidisciplinary sciences. *Science and Engineering Ethics*, **15** (4), 491-501.

Full Text: [2009\Sci Eng Eth15, 491.pdf](2009/Sci%20Eng%20Eth15,%20491.pdf)

Abstract: For academic research outcomes, there is an increasing emphasis on the bibliometric scorings like the journal impact factor and citations when the assessment of the scientific merits of research or researchers is required. Currently, no known study has been conducted to explore the bibliographical trends of the subject category of multidisciplinary sciences as indexed by the annual Journal Citation Reports of the Thomson Scientific. The effect of journal self-citations and intra-citing within a discipline to the bibliometric data computation can be confounding. In this study, six journals were selected from the multidisciplinary sciences subject category where the trend of self-citations and intra-citing were analysed. These journals were chosen as they published more than 450 citable articles in the year 2007 and had available bibliometric data for a 10-year period. The results showed that self-citations rose as much as +23.98% while intra-citing declined up to -5.80% over the observed period. The retrospective impacts and influences of these observations were also discussed in this study.

Keywords: Assessment, Bibliographical Database, Bibliometric Data, Citations, Classification, Impact, Impact-Factor, Indexing, Journal Impact Factor, Multidisciplinary, Publication, Research, Science Metrics, Self-Citations, Thomson Scientific

? Neale, A.V., Dailey, R.K. and Abrams, J. (2009), Analysis of citations to biomedical articles affected by scientific misconduct. *Science and Engineering Ethics*, **16** (2), 251-261.

Full Text: [2010\Sci Eng Eth16, 251.pdf](2010/Sci%20Eng%20Eth16,%20251.pdf)

Abstract: We describe the ongoing citations to biomedical articles affected by scientific misconduct, and characterize the papers that cite these affected articles. The citations to 102 articles named in official findings of scientific misconduct during the period of 1993 and 2001 were identified through the Institute for Scientific Information Web of Science database. Using a stratified random sampling strategy, we performed a content analysis of 603 of the 5,393 citing papers to identify indications of awareness that the cited articles affected by scientific misconduct had validity issues, and to examine how the citing papers referred to the affected articles. Fewer than 5% of citing papers indicated any awareness that the cited article was retracted or named in a finding of misconduct. We also tested the hypothesis that affected articles would have fewer citations than a comparison sample, this was not supported. Most articles affected by misconduct were published in basic science journals, and we found little cause for concern that such articles may have affected clinical equipoise or clinical care.

Keywords: Bibliometric Analysis, Journalology, Journal Citations, Quantitative Content Analysis, Retraction, Scientific Misconduct, Retraction, Mistakes, Medicine, Impact

? Foo, J.Y.A. (2011), Impact of excessive journal self-citations: A case study on the *Folia Phoniatrica et Logopaedica* journal. *Science and Engineering Ethics*, **17** (1), 65-73.

Full Text: [2011\Sci Eng Eth17, 65.pdf](2011/Sci%20Eng%20Eth17,%2065.pdf)

Abstract: There is an increasing trend towards assessing the scientific performance of researchers and institutions of higher learning in the form of journal publications and the associated citations. Currently, the journal impact factor (JIF) value is the most widely used measure for any academic contents. However, there are growing concerns for the unethical practices adopted by journal editors to manipulate the JIF computations. Recently, a Swiss journal, Folia Phoniatrica et Logopaedica which has a JIF value of 0.655 in the year 2006 registers a remarkable JIF increment (of 119%) to 1.439 in the year 2007. It is believed that the journal can achieve such a prominent JIF improvement by publishing a single editorial article that self-cited 66 of its own articles published either in the year 2005 or 2006. The journal has been revoked of any JIF value in the following year of 2008. Thus, it is interesting to review the possible alternative bibliographical trend for the journal should the self-cite event has been avoided, the circumstances leading to the decision by the editor to publish such an article and the possible ethical implications or lessons that can be derived from this incident.

Keywords: Alternative, Assessing, Association, Authors, Bias, Bibliographical Database, Bibliometric Data, Citations, Decision, Editors, Ethical, Impact, Impact Factor, Improvement, Indexing, Institutions, Journal, Journal Editors, Journal Impact, Journal Impact Factor, Learning, Mar, Measure, Peer-Reviewed Journals, Performance, Practices, Publication, Publications, Publishing, Quality, Retrospective Analysis, Review, Science, Scientific Performance, Trend, Trends, Value

# Title: The Science and Engineering Review of Doshisha University

(Sci. Eng. Rev., Doshisha Univ.)

Full Journal Title: The Science and Engineering Review of Doshisha University

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Hara, T., Endo, T., Ikeda, K. and Inaba, N. (1979), Concentration of heavy metal ions by use of synthetic pumice and its related adsorbents. *The Science and Engineering Review of Doshisha University*, **20**, 16-25.

# Title: Science Evaluation and Its Management

Full Journal Title: Science Evaluation and Its Management

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1387-6708

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rauch, H. (1999), Performance indicators for science evaluation. *Science Evaluation and Its Management*, **28**, 17-21.

Abstract: Various bibliometric methods exist for the evaluation of scientific work. They become more important since the process of publishing becomes easier and publishing becomes an important business factor as well. Impact factors and indicators are useful tools for comparisons within distinct disciplines. The time-dependence of the indicators can be a useful tool for the identification of priority fields in science. Comparisons between groups, institutions, and national activities should be restricted to distinct disciplines, and often to sub-disciplines. When these limits are transcended normalising factors have to be introduced. Bibliometric analysis requires highly experienced people. Self-citations and citation of pseudo-scientific work have to be excluded. In the future, first-authorship has to be distinguished from others, and alphabetically ordered authors from others, as well. Measures to be taken after science evaluation should be agreed in advance and positive stimulus should be given. The author’s own experiences with evaluation processes in Austria and the Czech Republic will be discussed.

Keywords: Analysis, Authors, Bibliometric, Bibliometric Analysis, Bibliometric Methods, Citation, Evaluation, First-Authorship, Future, Impact, Impact Factors, Indicators, Methods, Publishing, Science, Science Evaluation, Tools

? Braun, T. and Schubert, A. (1999), A bird’s eye view mapping and landscaping world science. *Science Evaluation and Its Management*, **28**, 22-30.

Abstract: Mapping is defined in dictionaries as the “science of drawing on maps and charts or otherwise representing the features of a region,” or, in a broader sense, the “study or description of a region, system or entity showing specific relations of component parts as to shape, size, position, etc.” In proportional maps, the relative position of the entities concerned (viz., countries) is more or less “natural”, while their size (area) is proportional to a certain scientometric extension (publication output, citation rate, etc.). Thereby, the relative weight of the countries is easily visualised and, assuming an implicit knowledge of the “natural” proportions, significant deviations can readily be pinpointed. By complementing multidimensional maps with proper shading or colouring (or both), multidimensional representations of scientometric indicators become possible.

Keywords: Citation, Countries, Indicators, Knowledge, Mapping, Publication, Publication Output, Science, Scientometric Indicators, Size, System

? Koutecky, J. (1999), Dialogue between scientists and evaluators as a means to properly choose and assess research directions. *Science Evaluation and Its Management*, **28**, 79-82.

Abstract: Evaluation is an important and powerful means to improve the quality of the scientific work. The chief part of the evaluation procedure should involve direct dialogue between scientists being evaluated and experts evaluating them. To this end, the experts must have good written reports at their disposal. The scientometric data must not only be considered, but very carefully so. The character of the internal and external valuation differs widely. The virtues of periodic evaluation activities are reviewed in thus paper. The only way maintain to a high level evaluation of the scientific process is to follow the peer review principle. What cannot be tolerated under any circumstances are bureaucratic decisions about the quality of scientific work.

Keywords: Evaluation, Peer Review, Peer-Review, Quality, Research

? Deliwe, M. (1999), Towards establishing indicators to evaluate performance within systems of innovation. *Science Evaluation and Its Management*, **28**, 103-113.

Abstract: A number of highly accurate quantitative indicators exist to measure the performance of innovative systems. These measures include bibliometrics, scientometrics and patent statistics. They are often supplemented by other sophisticated statistical and mathematical measures, often closely aligned to econometrics. Other techniques include input-process, output-analysis. There is little dispute that these techniques are quite useful. This paper argues that, while these techniques are quite useful, these measures have some limitations that flow, ironically, from their successes. These factors are often matters of equity and, or areas of market failure. This paper argues for an integrated system of indicators that will reflect the complexity of an innovation system and seek to uphold its ends: the improvement of the human conditions in utilitarian terms. This could be achieved if the indicators act as a comprehensive information system anchored on vital elements of both the innovation systems and utilitarian principles. These elements are identified as Equity, the Economy, Human Development, Indicators and Environmental Sustainability. The challenge will be to integrate reports from these research projects according to the needs of the inquirer at a given time. These indicators have the advantage of being problem-oriented and of addressing issues that are crucial to policy makers. They are ideal for indicating trends and tracing the impact of an innovation system in given places at given times, and also to enable contrast and comparisons to be made.

Keywords: Bibliometrics, Impact, Indicators, Innovation, Innovation System, Patent, Research, Research Projects, Scientometrics, Statistics, System, Trends

? Van Raan, A.F.J. (1999), Evaluation of performance and trends in basic and applied research by advanced bibliometric methods: A science policy instrument for nations with an economy in transition. *Science Evaluation and Its Management*, **28**, 227-245.

Abstract: This paper(1) presents an overview of advanced bibliometric methods for (1) assessment of strengths and weaknesses in research performance, and for (2) monitoring scientific developments. In the first application, we focus on the detailed analysis of research performance in an international (e.g., world-wide, European) comparative perspective. This type of analysis can be applied to different organisational levels, e.g., research groups, universities, government institutes, companies, research organisations, and countries. We demonstrate that our recently developed indicators are very informative. They are, particularly at the level of research groups, university departments and institutes, an indispensable element next to peer review in research evaluation procedures. At the national or, for instance, European level, bibliometric indicators are the building blocks of “S&T Observatories” developments. They provide insight into the scientific position of countries in terms of influence and specialisations. In the second application, monitoring of scientific (basic and applied) developments, recent advances in bibliometric mapping techniques are promising. They are unique instruments to discover patterns of scientific communication, processes of knowledge dissemination, and structural dynamics of scientific developments. These mapping methods also enable us to specifically focus on countries with an economy and an S&T system “in transition”. We discuss this “bibliometric cartography” briefly and indicate its potential for unravelling multidisciplinary developments and interfaces between science and technology. This is important, as we know that multidisciplinary cross-roads of basic and applied scientific fields are often the loci of discovery and technological innovation. We present recent, practical examples. Advanced bibliometric methods have now come to a stage of providing excitement, instead of “just statistics”. They become, in fact, next to their intrinsic values for the study of science and technology, more and more an important branch of information technology.

Keywords: Advances, Analysis, Application, Assessment, Bibliometric, Bibliometric Indicators, Bibliometric Mapping, Bibliometric Methods, Building, Communication, Discovery, Dynamics, Economy, Evaluation, First, Indicators, Influence, Information, Information Technology, Innovation, Insight, Interfaces, International, Knowledge, Mapping, Methods, Monitoring, Multidisciplinary, National, Nations, Peer, Peer Review, Peer-Review, Performance, Policy, Potential, Procedures, Research, Research Evaluation, Research Performance, Review, Science, Science and Technology, Science Policy, Scientific Communication, Techniques, Technological Innovation, Technology, Transition, Trends, Universities, University, Values

? Gomez-Caridad, I. (1999), Bibliometric indicators for research evaluation: Inter-field differences. *Science Evaluation and Its Management*, **28**, 256-265.

Abstract: Bibliometric indicators used to quantify scientific performance and impact at the macro-level are usually obtained from international multidisciplinary databases. Their adequacy varies with the country analysed, the field of science and the publication habits of scientists, as the vehicles used to diffuse research results vary from experimental basic sciences to applied sciences and engineering and to social sciences and humanities. A validation at the meso-level is presented, studying the activity of the Spanish Research Council through its Annual Reports and how it is reflected in international databases. The use of specific and multiple performance indicators adapted to each area is suggested.

Keywords: Bibliometric, Bibliometric Indicators, Databases, Evaluation, Field, Humanities, Impact, Indicators, Journals, Performance Indicators, Publication, Research, Research Collaboration, Research Evaluation, Research Results, Science, Sciences, Scientific Performance, Social Sciences, Spanish

# Title: Science Focus

Full Journal Title: Science Focus

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? 金碧辉(2006), 科学家为自己设计了一项评价指标：h指数. *Science Focus*, **1** (1), 8-9.

Full Text: [2006\Sci Foc1, 8.pdf](2006/Sci%20Foc1,%208.pdf)

? Glänzel, W. (2006), 也谈h指数的机会和局限性. *Science Focus*, **1** (1), 10-11.

Full Text: [2006\Sci Foc1, 10.pdf](2006/Sci%20Foc1,%2010.pdf)

? Mele, S., Dallman, D., Vigen, J. and Yeomans, J. (2007), 高能物理研究论文的定量分析. *Science Focus*, **2** (2), 11-19.

Full Text: [2007\Sci Foc2, 11.pdf](2007/Sci%20Foc2,%2011.pdf)

? Ronald N. Kostoff, R.N., Briggs, M.B., Rushenberg, R.L., Bowles, C.A., Bhattacharya, S., Johnson, D., Icenhour, A.S., Nikodym, K., Barth, R.B., Dodbele, S. and Pecht, M. (2007), 用文献计量数据解读中国和印度的科技发展. *Science Focus*, **2** (4), 1-6.

Full Text: [2007\Sci Foc2, 1.pdf](2007/Sci%20Foc2,%201.pdf)

? (2008), 印度科学研究的新千年. *Science Focus*, **3** (6), 60-61.

Full Text: [2008\Sci Foc3, 60.pdf](2008/Sci%20Foc3,%2060.pdf)

? King, C. (2009), 谁是能源研究的引领者？*Science Focus*, **4** (1), 54-57.

Full Text: [2009\Sci Foc4, 54.pdf](2009/Sci%20Foc4,%2054.pdf)

# Title: Science Indicators for Developing Countries

Full Journal Title: Science Indicators for Developing Countries

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Schubert, A. and Braun, T. (1992), 3 Scientometric studies on developing countries as a tribute to Moravcsik,Michael. *Science Indicators for Developing Countries*, 49-64.

Keywords: Scientometric, Tribute

? Thomas, S.M. (1992), The evaluation of plant biomass research - A case study of the problems inherent in bibliometric indicators. *Science Indicators for Developing Countries*, 149-154.

Keywords: Bibliometric, Research

? Krauskopf, M. (1992), Scientometric indicators as a means to assess the performance of state supported universities in developing countries - the Chilean case. *Science Indicators for Developing Countries*, 209-224.

Keywords: Scientometric, Universities

? Sen, B.K. (1992), Evaluation of recent scientific research output by bibliometric method. *Science Indicators for Developing Countries*, 225-237.

Keywords: Bibliometric, Research, Research Output

? Lancaster, F.W. and Abdullah, S.B. (1992), Science and Politics - Some Bibliometrics Analysis. *Science Indicators for Developing Countries*, 319-331.

Keywords: Bibliometrics, Science

? Ramos, M.F. (1992), Bibliometric Analysis Applied to A Science Policy Database. *Science Indicators for Developing Countries*, 637-643.

Keywords: Bibliometric, Bibliometric Analysis, Science

# Title: Science International-Lahore-

(Sci. Int. (Lahore))

Full Journal Title: Science International-Lahore-

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Muhammad, D. and Hussain, R. (1992), Adsorption of lead from aqueous solutions by poly (methyl methacrylate). *Science International-Lahore-*, **4**, 143-145.

# Title: Science & Justice

Full Journal Title: Science & Justice

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Jones, A.W. (2005), Which articles and which topics in the forensic sciences are most highly cited? *Science & Justice*, **45** (4), 175-182.

Full Text: [2005\Sci Jus45, 175.pdf](2005/Sci%20Jus45,%20175.pdf)

Abstract: Forensic science is a multidisciplinary field, which covers many branches of the pure, the applied and the biomedical sciences. Writing-up and publishing research findings helps to enhance the reputation of the investigators and the laboratories where the work was done. The number of times an article is cited in the reference lists of other articles is generally accepted as a mark of distinction. Indeed, citation analysis has become widely used in research assessment of individual scientists, university departments and entire nations. This article concerns the most highly cited papers published in the Journal of Forensic Sciences (JFS) between 1956 and 2005. These were identified with the help of Web-of-science, which is the on-line version of Science Citation Index, produced by Thomson Institute for Scientific Information (Thomson ISI) with head offices in Philadelphia, USA. This database tracks, among other things, the annual citation records of articles published in several thousand scientific journals worldwide. Those JFS articles accumulating 50 or more citations were identified and rank-ordered according to the total number of citations. These articles were also evaluated according to the name of first author, the subject category of the article, the country of origin and the pattern of co-authorship. This search strategy located 46 articles cited between 50 and 292 times since they first appeared in print. The most highly cited paper by far was by Kasai, Nakamura and White (USA and Japan) concerning DNA profiling and the application of the polymerase chain reaction (PCR) in forensic science. Some forensic scientists appeared as first author on two to three highly cited articles, namely Wetli (USA), Budowle (USA) and Comey (USA). When the highly cited articles were sub-divided into subject category, 15 were identified as coming from toxicology, closely followed by criminalistics (14 articles), pathology (nine articles), physical anthropology (five articles), forensic psychiatry (two articles) and one from odontology. The number of co-authors on these highly cited articles ranged from one to nine and the names of some investigators appeared on as many as four highly cited papers. The vast majority of papers originated from US laboratories although five came from Japan, two each from Sweden and Canada and there was also a joint USA-Swiss collaboration. The Thompson ISI citation databases provide unique tools for tracking citations to individual articles and impact and citation records of scholarly journals.

Keywords: Analysis, Anthropology, Assessment, Authorship, Bibliometrics, Biomedical, Citation, Citation Analysis, Citation Index, Citations, Co-Authorship, Coauthorship, Collaboration, Database, Databases, DNA, Field, Forensic Science, Highly-Cited, Impact, Institute For Scientific Information, ISI, Japan, Journals, Nations, Origin, Papers, PCR, Profiling, Psychiatry, Publications, Publishing, Reference, Research, Research Assessment, Science, Science Citation Index, Sciences, Scientific Information, Scientific Journals, Sweden, Thomson ISI, Tools, Topics, Toxicology, University, US, USA, Web of Science

# Title: Science Progress

Full Journal Title: [Science Progress](http://infotrac.galegroup.com/itw/infomark/0/1/1/purl=rc18_EAIM_0__jn+%22Science+Progress%22?sw_aep=jrycal5)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: OOriginal

? Cole, F.J. and Eales, N.B. (1917), The history of comparative anatomy, Part I. A statistical analysis of the literature. *Science Progress*, **11** (44), 578-596.

# Title: Science and Public Policy

Full Journal Title: [Science and Public Policy](http://www.ingentaconnect.com/content/beech/spp)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Katz, J.S. (2000), Scale-independent indicators and research evaluation. *Science and Public Policy*, **27** (1), 23-36.

Full Text: [2000\Sci Pub Pol27, 23.pdf](2000/Sci%20Pub%20Pol27,%2023.pdf)

Abstract: This paper demonstrates that some conventional indicators used in research evaluation may fail to account for the non-linearity between size of institution and performance. This can result in an over- or under-estimation of the research performance of both large and small institutions and nations. This paper shows that a power law relationship exists between recognition or impact and (a) publishing size of scientific communities within an OECD science system and (b) publishing size of a research community across OECD science systems or institutions in a science system. Also, a power law relationship exists between the amount of various types of collaboration and the publishing size of institutions. A new class of scale-independent indicators is developed to overcome the inequity produced by some nonlinear characteristics commonly measured when evaluating research performance.

? Calvert, J. and Patel, P. (2003), University-industry research collaborations in the UK: Bibliometric trends. *Science and Public Policy*, **30** (2), 85-96.

Full Text: [2003\Sci Pub Pol30, 85.pdf](2003/Sci%20Pub%20Pol30,%2085.pdf)

Abstract: Despite increasing interest amongst policy makers and academics, there have been few attempts at gathering systematic data on the nature and extent of research collaborations between universities and industry. This paper uses joint scientific publications as an indicator of such collaborations in the UK over 20 years. It finds that, although there has been a rapid increase in the volume of university–industry collaborations since the 1980s, the biggest increases were before the major policy measures of the mid-1990s. An important factor would appear to be the growing need for firms, especially non-British firms, to collaborate with leading-edge academic research in promising areas of new technology.

? Hessels, L.K., Grin, J. and Smits, R.E.H.M. (2011), The effects of a changing institutional environment on academic research practices: Three cases from agricultural science. *Science and Public Policy*, **38** (7), 555-568.

Full Text: [2011\Sci Pub Pol38, 555.pdf](2011/Sci%20Pub%20Pol38,%20555.pdf)

Abstract: This paper investigates the varying effects of a changing institutional environment on academic research practices in three fields of Dutch animal science. Our analysis shows that the shifts in funding have stimulated interactions with societal stakeholders in fields where this has helped to sustain a basic research agenda. In other fields researchers experience a tension between satisfying the needs of application-oriented funding sources and reaching high scores on evaluations dominated by bibliometric indicators. The paper concludes with the identification of three field characteristics that seem to moderate the effects of institutional changes on academic research practices.

Keywords: Agenda, Analysis, Bibliometric, Bibliometric Indicators, Environment, Funding, Impact, Output, Regimes, Research, Researchers, Science, System

? Fagerberg, J. and Sapprasert, K. (2011), National innovation systems: The emergence of a new approach. *Science and Public Policy*, **38** (9), 669-679.

Full Text: [2011\Sci Pub Pol38, 669.pdf](2011/Sci%20Pub%20Pol38,%20669.pdf)

Abstract: The term ‘national innovation systems’ surfaced for the first time in print during the late 1980s and, in the years that followed, several important contributions on this topic appeared. This paper investigates the role that this new literature plays within innovation studies and the world of science more generally and discusses the sources for its emergence. With the help of expert assessments, the three most important contributions to the ‘national innovation systems’ literature are identified. Then the citations to these works in scholarly journals in the Web of Science are presented and the characteristics of the ‘national innovation systems’ literature, as compared with other areas of research, are analyzed.

Keywords: Citations, Historical-Perspective, Innovation, Journals, Literature, Research, Scholarly Journals, Science, Web of Science

# Title: Science of Science and Management of S. & T.

Full Journal Title: [Science of Science and Management of S. & T.](http://www.ilib2.com/P-QCode~kxxykxjsgl.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1002-0241

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhao, L.J. (2005), A literature review of basic research performance evaluation. *Science of Science and Management of S. & T.*, **10**, 44-48.

Full Text: [2005\Sci Sci Man10, 44.pdf](2005/Sci%20Sci%20Man10,%2044.pdf)

Keywords: Basic Research, Performance Evaluation, Indicator System, Peer Review, Bibliometric Analysis, Literature Review

? Xu, Z. (2006), Current situation and development trend of basic science research in Xinjiang based on the analysis of the articles Indexed in SCI-E. *Science of Science and Management of S. & T.*, **4**, 28-38.

Full Text: [2006\Sci Sci Man4, 28.pdf](2006/Sci%20Sci%20Man4,%2028.pdf)

Abstract: Based on the data abstracted from SCI-E database during the period 1997-2005, the paper shows that basic science in Xin jiang has made a good progress, while the scientific writing index is still lower and need to be increased. Xinjiang University and Urumqi is the center of scientific activity respectively in the aspects of institute and location. The distribution of scientific activity in Xinjiang is of obvious difference with other areas and institutes. In addition, international scientific collaborative.

Keywords: SCI-E, Xinjiang, Basic Science, Gray Prediction, Scientometrics

? Chen, L.X., Liang, L.M. and Liu, Z.Y. (2006), Is there Matthew effect in international collaboration of mechanics research? *Science of Science and Management of S. & T.*, **8**, 12-43.

Full Text: [2006\Sci Sci Man8, 12.pdf](2006/Sci%20Sci%20Man8,%2012.pdf)

Abstract: Based on the statistics and analyses of 168689 articles published in SCI source journals in the field of mechanics, this paper explored the relationship between productivity and international scientific collaboration. The investigation indicates that there exists Matthew effect in international collaboration of mechanics research. The less productive countries prefer to collaborate with the more productive countries. The more productive a country is, the higher its first authors’ ratio is. The country with ...

Keywords: International Scientific Collaboration, Mechanics, Matthew Effect, Scientometrics

? Jin, J., Ma, Z. and Liang, Z.P. (2007), An analysis on China-US cooperation in science and technology from the perspective of China-US co-authored papers’ status. *Science of Science and Management of S. & T.*, **5**, 41-47.

Full Text: [2007\Sci Sci Man5, 41.pdf](2007/Sci%20Sci%20Man5,%2041.pdf)

Abstract: The large amount of data concerning China-US co-authored papers in science and technology from the year of 1978 to 2005 have been collected, organized and analized in a thorough way by applying the bibliometric research method. The total scale, ratio and their changes, scientific disciplines, participating agencies and publishing journals of the co-authored papers in the past and the present have been statistically ranked and evaluated as a preliminary study on the performance evaluation of the internation...

Keywords: Science Citation Index (SCI), Co-Authorship, Bibliometrics, International

? Cheng, Y. and Niancai, L.I.U. (2007), Mapping the development of Chinese top universities in recent years based on scientometric indicators. *Science of Science and Management of S. & T.*, **28** (9), 132-138.

Full Text: [2007\Sci Sci Man28, 132.pdf](2007/Sci%20Sci%20Man28,%20132.pdf)

Abstract: This study reviews the changes of 9 Chinese top universities supported by “985 project” during 1997-2005 based on the analysis of a series of scientometric indicators. The following indicators total number of publications indexed by SCIE and SSCI, cumulated impact factor, average expected quality of publications, percentage of publications in top journals, are calculated for each university: number of publications per faculty, and the index of disciplinary balance. Several suggestions are made for Chinese top universities on how to improve research quality, how to better integrate into global academic society and how to facilitate interdisciplinary research.

Keywords: Impact, Research

? Jibao, G.U., Rui, F.A.N. and Liang, L. (2008), The influence of administrative status on the development of discipline. *Science of Science and Management of S. & T.*, **29** (3), 109-114.

Full Text: [2008\Sci Sci Man29, 109.pdf](2008/Sci%20Sci%20Man29,%20109.pdf)

Abstract: Based on the supposing that development of discipline is affected by administrative status through acquiring science and technology resources and development chances, we consider that the number of research production of a school dean’s discipline has a distinct change before and after his election. We chose academic papers of the new-elected deans of 43 management schools in “211 project” universities as research objects, collected and analyzed the papers of the deans’ stair discipline and all the papers of the schools, and tested the percentage of papers of the deans’ stair discipline to all the papers of the schools by paired samples T-test with statistics software of SPSS. We find that the election of the dean has a distinct effect on the number of the papers of his discipline.

Keywords: Research, Software

? Hou, X.G., Luan, S.J. and Yang, Z.P. (2008), A bibliometric evaluation of environmental assessment-related research in SCI from 1996-2005. *Science of Science and Management of S. & T.*, **12**, 38-43.

Full Text: [2008\Sci Sci Man12, 38.pdf](2008/Sci%20Sci%20Man12,%2038.pdf)

Abstract: To determine the characteristics of scientific productivity of EA study, a bibliometric analysis of 1,320 EArelated papers in SCI from 1996-2005 was performed. The results indicate that EA-related studies have kept a steady increase since 1996, and EA was a popular topic for scientists. Environmental science and engineering ＆ environmental were the major subject categories of EA-related studies in SCI. The distribution of EA-related papers in journals was discrete. International collaboration was enhanced during the period of 1996-2005 on EA study, and obviously international co-authored papers were more visible than single-country papers. Developed countries have taken advantage to produce EA-related papers. There were three impeditive factors holding back the EA-Research: lack of continuity, low visibility and the difficulties they faced. Limitations of this bibliometric analysis are the incompletion of original data and the bias.

Keywords: Bibliometric Evaluation, Environmental Assessment, SCI, IF, CPP

# Title: Science and Technology in Catalysis 1994 Studies in Surface Science and Catalysis

Full Journal Title: Science and Technology in Catalysis 1994 Studies in Surface Science and Catalysis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kresge, C.T., Vartuli, J.C., Roth, W.J., Leonowicz, M.E., Beck, J.S., Schmitt, K.D., Chu, C.T.W., Olson, D.H., Sheppard, E.W., McCullen, S.B., Higgins, J.B. and Schlenker, J.L. (1995), M41S: A new family of mesoporous molecular sieves prepared with liquid crystal templates. *Science and Technology in Catalysis 1994 Studies in Surface Science and Catalysis*, **92**, 11-19.

Abstract: The use of cationic surfactants as the structure directing agents resulted in the discovery of the first mesoporous aluminosilicate molecular sieves. One class of materials within this extensive and diverse family possesses a hexagonal array of uniform pores. This dass is designated MCM-41 and the pore size can be tailored in the range 15 to 100 Angstrom. The presence of discrete large pores in MCM-41 is reflected in their high adsorption capacity and some unique features, such as capillary condensation without hysteresis. Other distinct members of the mesoporous family include materials denoted MCM-48 with a well-defined structure having cubic symmetry.

These aluminosilicate systems have shown behavior parallel to that of lyotropic liquid crystals including certain phenomena peculiar to the surfactant systems. The latter include the aforementioned structural diversity, and pore size variation in response to either change of surfactant chain length or the presence of swelling organic agents. To explain the formation and properties of the new molecular sieves, a liquid crystal templating mechanism has been proposed.

Keywords: Silicate Solutions, Cubic Phases, Lipid Systems, Anions, Surfactant

# Title: Science, Technology & Human Values

Continues [Newsletter on Science, Technology, & Human Values](http://www.jstor.org/browse/07382618?frame=noframe&userID=8c700279@ntu.edu.tw/01cc99333c0050195c7e0&dpi=3&config=jstor)

Full Journal Title: [Science, Technology & Human Values](http://www.jstor.org/browse/01622439?config=jstor), [Science, Technology & Human Values](http://www.ingentaconnect.com/content/sage/j239), [Science, Technology & Human Values](http://infotrac.galegroup.com/itw/infomark/1/1/1/purl=rc18_EAIM_0__jn+%22Science%2C+Technology%2C+%26+Human+Values%22?sw_aep=jrycal5)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0162-2439

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cano, V. (1988), Scientometrics for Less Developed-Countries. *Science, Technology & Human Values*, **13** (1-2), 106-107.

Keywords: Scientometrics

? Glaenzel, W., Schubert, A. and Braun, T. (1988), On the Theory and Application of Scientometric Indicators. *Science, Technology & Human Values*, **13** (1-2), 125-126.

Keywords: Scientometric

? Nederhof, A.J. and Zwaan, R.A. (1988), Quality judgments of journals in the humanities and the social-sciences as scientometric indicators - A comparative-study. *Science, Technology & Human Values*, **13** (1-2), 156.

Keywords: Scientometric

? Garfield, E. (1988), Price, Derek and the Practical World of Scientometrics. *Science, Technology & Human Values*, **13** (3-4), 349-350.

Full Text: [1988\Sci Tec Hum Val13, 349.pdf](1988/Sci%20Tec%20Hum%20Val13,%20349.pdf)

Keywords: Scientometrics

? Coward, H.R. and Franklin, J.J. (1989), Identifying the science-technology interface - matching patent data to a bibliometric model. *Science, Technology & Human Values*, **14** (1), 50-77.

Full Text: [S\Sci Tec Hum Val14, 50.pdf](S/Sci%20Tec%20Hum%20Val14,%2050.pdf)

? Hicks, D.M. and Katz, J.S. (1996), Where is science going? *Science, Technology & Human Values*, **21** (4), 379-406.

Full Text: [S\Sci Tec Hum Val21, 379.pdf](S/Sci%20Tec%20Hum%20Val21,%20379.pdf)

Abstract: Do researchers produce scientific and technical knowledge differently than they did ten years ago? What will scientific research look like ten years from now? Addressing such questions means looking at science from a dynamic systems perspective. Two recent books about the social system of science, by Ziman and by Gibbons, Limoges, Nowotny, Schwartzman, Scoff and Trow, accept this challenge and argue that the research enterprise is changing. This article uses bibliometric data to examine the extent and nature of changes identified by these authors, taking as an example British research. We use their theoretical frameworks, to investigate five characteristics of research said to be increasingly pervasive-namely, application, interdisciplinarity, networking, internationalization, and concentration of resources. Results indicate that research may be becoming more interdisciplinary and that research is increasingly conducted more in networks, both domestic and international, but the data are more ambiguous regarding application and concentration.

Keywords: Bibliometric, Collaboration, Research, Science

? Mahlck, P. (2001), Mapping gender differences in scientific careers in social and bibliometric space. *Science, Technology & Human Values*, **26** (2), 167-190.

Full Text: [2001\Sci Tec Hum Val26, 167.pdf](2001/Sci%20Tec%20Hum%20Val26,%20167.pdf)

Abstract: Despite a growing interest in gender differences in scientific careers, few studies have focused an the impact of research organization on researchers. This article offers a new approach to this issue by introducing bibliometric maps combined with sociological data and interviews, taking both the research organization and the experiences of the individual researcher into account. The results indicate that gender blares operate at various levels of the research organization and are often imbedded in seemingly gender-neutral processes and practices in the everyday working life of researchers.

Keywords: Bibliometric, Careers, Citations, Gender, Gender Differences, Impact, Impact of Research, Research

? Dalpé, R., Bouchard, L., Houle, A.J. and Bédard, L. (2003), Watching the race to find the breast cancer genes. *Science, Technology & Human Values*, **28** (2), 187-216.

Full Text: [2003\Sci Tec Hum Val28, 187.pdf](2003/Sci%20Tec%20Hum%20Val28,%20187.pdf)

Abstract: This article focuses on a crucial development in genetic research that occurred in the 1990s: the identification of the first two of the genes responsible for hereditary breast and ovarian cancer (BRCA I and BRCA2). Issues addressed touch on the evolution of the subfield, its potential impact on cancer treatment, and industry, involvement. The article follows the activities of the various research groups competing in the race to identify the genes and depicts the frequent conflicts between them. Data are derived chiefly from a bibliometric database. The results show a diversity of research practices. Industrial researchers interacted within jar more tightly knit networks than their counterparts working in public organizations. The patenting and commercial exploitation of results led to fierce battles, with one group capturing most of the benefits.

Keywords: Science Policy, University-Industry Relations, Genetics, BRCA Genes, BRCA2 Mutations, Ovarian-Cancer, Patent, Disease, Risk, Discovery, Science, Dispute, Debate, Women

# Title: Science and Technology Libraries

Full Journal Title: [Science and Technology Libraries](http://www.swetswise.com/eAccess/viewTitleIssues.do?titleID=182631), [Science and Technology Libraries](http://www.informaworld.com/smpp/title~content=t792306969~db=jour)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sears, J. (1988), Coverage of conference documents in scientific databases: Viewpoint of Cambridge Scientific Abstracts. *Science and Technology Libraries*, **9** (2), 35-45.

Full Text: [1988\Sci Tec Lib9, 35.pdf](1988/Sci%20Tec%20Lib9,%2035.pdf)

Abstract: An outline is given of the nature and some problems of conference literature, its treatment by two bibliographic databases-published by Cambridge Scientific Abstracts Conference Papers Index (CPI) and Aquatic Sciences and Fisheries Abstracts (ASFA)--is described, giving some bibliometric data on conference documents in these files. The author concludes that a flexible approach to searching for conference documents will improve search results.

Keywords: Approach, Bibliometric, Data, Databases, Literature, Papers, Search, Treatment

? Sutton, E.D. (1993), Sources of information on sensory perception and psychophysics. *Science and Technology Libraries*, **13** (3-4), 71-89.

Full Text: [1993\Sci Tec Lib13, 71.pdf](1993/Sci%20Tec%20Lib13,%2071.pdf)

Keywords: Information, Perception

? Gandhi, S. (2000), Biometrics information: One-stop shopping. *Science and Technology Libraries*, **18** (4), 29-50.

Full Text: [2000\Sci Tec Lib18, 29.pdf](2000/Sci%20Tec%20Lib18,%2029.pdf)

Abstract: The article briefly describes biometry and the latest developments in that field. An outline of descriptors or subject headings used for biometry in the subject authority lists and indexing tools is given. A bibliometric analysis of biometrics literature from leading Online databases is included. The main section of the article contains the titles, links, a short description and contact for about fifty Web sites which may be useful to biometricians and researchers. It also lists important discussion groups and listserves in biometrics. To find an effective Internet tool for biometrics research the author performed exhaustive searches on eight search engines and presents an analytical overview of those results.

Harande, Y. (2001), Bibliometric analysis of economic geology literature from Africa 1993-1996. *Science and Technology Libraries*, **20** (4), 45-54.

Full Text: [2001\Sci Tec Lib20, 45.pdf](2001/Sci%20Tec%20Lib20,%2045.pdf)

Abstract: Geological Abstracts (a print database) was used to compile a bibliography of economic geology literature from Africa, for the period 1993-1996. Two hundred and twenty-two items were recorded within the period studied and analyzed using simple statistical methods. The analyses were done according to contributions to the sub-divisions of the economic geology literature. Growth pattern of the field was also taken into consideration as well as which African countries contributed to the literature of economic geology. The findings of the study exhibit that African geological researchers were more active in certain areas of the economic geology literature, especially in the areas of energy sources and metals. All of the African contributions were in the form of research papers. Only six countries-South Africa, Nigeria, Zambia, Egypt, Tunisia, and Ghana-consistently contributed to the field of Economic Geology, one or more publications each year within the period studied.

Keywords: Geology Literature, African Publications, Bibliometric Analysis, Bibliography, Economic Geology, Geology Literature, African Geologists, Researchers, Growth Pattern, Contribution, Research papers

? Morrisey, L.J. (2002), Bibliometric and bibliographic analysis in an era of electronic scholarly communication. *Science & Technology Libraries*, **22** (3-4), 149-160.

Full Text: [2002\Sci Tec Lib22, 149.pdf](2002/Sci%20Tec%20Lib22,%20149.pdf)

Abstract: Bibliometric analysis of citation data is important to scientist and librarian alike. With alternate means of scientific scholarly communication proliferating, it’s important to be able to accurately link publications and their references. This article highlights some of the current problems that arise when doing citation analysis of different kinds of scientific scholarly Communication. A combination of better bibliographic control, interactive systems, and adherence to standardized electronic publishing protocols would improve the accuracy and reliability of the citation data retrieved.

Keywords: Accuracy, Analysis, Authors, Bibliographic Control, Bibliometric, Bibliometric Analysis, Bibliometrics, Citation, Citation Analysis, Communication, Publications, Publishing, References, Reliability, Scholarly Communication

? Kraus, J.R. (2002), Citation patterns of advanced undergraduate students in biology, 2000-2002. *Science and Technology Libraries*, **22** (3-4), 161-179.

Full Text: [2002\Sci Tec Lib22, 161.pdf](2002/Sci%20Tec%20Lib22,%20161.pdf)

Abstract: Thirty-three undergraduate student papers in biology that were presented at an annual symposium of undergraduate research at the University of Denver from 2000 through 2002 were evaluated. There were a total of 770 citations with an average of 23.3 citations per paper. It was determined that 76.2% of the citations came from journal articles, 16.4% came from books or book chapters, 6.4% were to other miscellaneous sources, and only 1.0% were to Web sites. Other findings include the top cited journals, the oldest cited journal articles, the average age and range of books and journals, the types of miscellaneous sources cited, and the stability of the cited Web sites.

? Bremholm, T.L. (2004), Challenges and opportunities for bibliometrics in the electronic environment: The case of the Proceedings of the Oklahoma Academy of Science. *Science and Technology Libraries*, **25** (1-2), 87-107.

Full Text: [2004\Sci Tec Lib25, 87.pdf](2004/Sci%20Tec%20Lib25,%2087.pdf)

Abstract: The digitization of back issues of print journals creates opportunities for bibliometric analysis using the electronic text files. Using readily available software, simple methods, and a little creativity, librarians call extract and manipulate information from database search results and from digitized journals for analysis of publication and citation behavior. The current study describes methods and results from a bibliometric and citation analysis of the electronic Version of the Proceedings of the Oklahoma Academy of Science. This study illustrates the opportunities as well as the challenges for bibilometrics and citation analysis in the electronic environment. As more journals migrate to the digital environment, issues of access, copyright and fair use, online file formats, and idiosyncrasies in the digital files may limit the opportunities for bibliometric analysis. Copyright 2004 by The Haworth Press, Inc. All rights reserved.

# Title: Science of the Total Environment

Full Journal Title: [Science of the Total Environment](http://www.sciencedirect.com/science/journal/00489697)

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Environmental Sciences: Impact Factor 1.126, 40/126 (1999), Impact Factor 1.252, 35/127 (2000), Impact Factor 1.925, 24/134 (2004), Impact Factor 2.224, 22/140 (2005), Impact Factor 2.182, 38/160 (2007), Impact Factor 2.578, 33/163 (2008), Impact Factor 2.905, 31/180 (2009)

Lester, J.N., Harrison, R.M. and Perry, R. (1979), The balance of heavy metals through a sewage treatment works. I. Lead, cadmium and copper. *Science of the Total Environment*, **12** (1), 13-23.

Full Text: [S\Sci Tot Env12, 13.pdf](S/Sci%20Tot%20Env12,%2013.pdf)

Abstract: Concentrations of lead, cadmium and copper have been determined in the sewage sludges, sewages and effluent of a sewage treatment works. Treatment at this works is by primary sedimentation prior to biological treatment in a diffused air activated sludge plant. By analysis of composite samples corresponding to a 24-h input of raw sewage to the works, a mass balance of metals through the works has been estimated. The partition of the metals from raw sewage into the settled sewage and primary sludge, and from the settled sewage into the activated sludge and final effluent has been quantified.

Shamberger, R.J. (1981), Elenium in the environment. *Science of the Total Environment*, **17** (1), 59-74.

Full Text: [S\Sci Tot Env17, 59.pdf](S/Sci%20Tot%20Env17,%2059.pdf)

Abstract: Selenium is one of the most widely distributed elements of the earth’s crust. Much of the selenium in the earth’s crust occurs associated with sulfide minerals. The presence or absence of selenium in any soil is dependent upon the composition of the parent material, and is also dependent upon leaching or processes subsequent to soil formation, that may have added selenium. Selenium can be easily oxidized from Se0 to Se+4 or Se+6. Selenium is usually recovered as a by-product of the refining of the sulfide ores of other metals such as copper. The greatest amounts of selenium are used for the manufacture of the photoelectric cell.

Selenium is taken up by plants as selenate, selenite or organic selenium. Se75 selenite in 30 minutes was translocated primarily to selenomethionine. In sheep or pigs the duodenum is the main site of Se75 absorption. Selenium is excreted in the feces, the urine, and the expired air, the amounts and proportions depending upon the level and form of the intake, the nature of the rest of the diet, and the species. A dietary intake of 0.1 μg/g Se provides a satisfactory margin of safety for grazing sheep and cattle. In humans, the recommended daily allowance for selenium is between 100 to 200 μg/day. The toxicity of selenium to animals varies with the amounts of chemical forms of selenium ingested, with the duration and continuity of intake, and with the type and nature of the diet, especially its protein and sulfate content.

Deficiency of selenium results in selenium responsive diseases in various animal species, such as muscular dystrophy, exudative diathesis and hepatosis dietetica. Selenium also prevents several type of chemically induced cancer in animals, and, where more selenium occurs in the environment, human cancer death rates are lower. Selenium deficient rats and lambs develop abnormal electrocardiograms accompanied by blood pressure changes. Human heart disease mortality is also lower in the high selenium areas. In China, a large clinical trial is underway showing that selenium prevents a congestive heart failure in children from severely selenium deficient areas.

? Zielhuis, R.L. and Haring, B.J. (1981), Water hardness and mortality in the Netherlands. *Science of the Total Environment*, **18** (1), 35-45.

Full Text: [1981\Sci Tot Env18, 35.pdf](1981/Sci%20Tot%20Env18,%2035.pdf)

Abstract: In 1975 central water softening was discouraged by the Public Health Council because of the statistical negative association found in 23 communities between the hardness of drinking water and death rate from Ischemic Heart Disease (I.H.D.) over the period 1958-1970. Further studies were carried out during the last decade by a specially assigned interdisciplinary Working Group of the Health Aspects of Central Water Softening. Recent studies showed that the release of metals (Pb and Cu) from household water distribution pipes was positively correlated with water calcium. Furthermore a significant negative correlation was found between hardness and pH for these types of water. The hypothesis that the Ca and Mg deficiency in areas with soft drinking water increases the risk of I.H.D. death rate was supported by the finding that food looses more Ca and Mg when it is cooked in soft water as compared to cooking in hard water. In contrast with earlier statistical investigations no significant relations were found over the period 1970-1977 between I.H.D. mortality and hardness of drinking water in 30 municipalities. The disappearance of the statistical relation could not be attributed to changes in water hardness. However, investigation of a group of 17 municipalities of which mortality and water quality data are known for three periods, 1958-1962, 1965-1970 and 1971-1977, showed that the inverse statistical relation between I.H.D. mortality and water hardness still existed but with decreasing significance of correlation coefficients. The provisional conclusion of the Working Group is that other factors than water hardness overrule to a large extent the potential effect on I.H.D. mortality. Central water softening down to 2-3 meq/l Ca probably will have no observable effect on mortality. Other studies are still continuing. In 1981 a final report will be presented to the Minister of Health and Environmental Protection.

? Amavis, R. and Smeets, J. (1981), Directive of the European Communities relating to the quality of water for human consumption. *Science of the Total Environment*, **18**, 293-300.

Full Text: [1981\Sci Tot Env18, 293.pdf](1981/Sci%20Tot%20Env18,%20293.pdf)

Abstract: A draft directive relating to the quality of water for human consumption was submitted on 22 July 1975 to the Council of Ministers of the European Communities. The submission of this proposition was requested by the Council of Ministers in the Action Programme of the European Communities on the environment, approved by them on 22 November 1973. The objective is the protection of public health by establishing standards to be respected by the Member States. This directive was adopted by the Council of Ministers of the European Communities June 30, 1980. This report deals with technical aspects of this directive and gives some additional comments.

Robberecht, H., Vangrieken, R., Vansprundel, M., Vandenberghe, D. and Deelstra, H. (1983), Selenium in environmental and drinking waters of Belgium. *Science of the Total Environment*, **26** (2), 163-172.

Full Text: [S\Sci Tot Env26, 163.pdf](S/Sci%20Tot%20Env26,%20163.pdf)

Abstract: The tetravalent and hexavalent selenium content of water samples can be determined by conventional energy-dispersive X-ray fluorescence after different preconcentration steps. Selenium values of nearly three-hundred different environmental and drinking water samples in Belgium are reported. The results are quite low, ranging from the detection limits up to 1 μg l−1. The concentration levels are compared to literature data and the speciation is discussed.

The contribution of drinking water to the daily intake of selenium in Belgium ranges from less than 0.2 to 5%.

Bedding, N.D., McIntyre, A.E. and Lester, J.N. (1983), Organic contaminants in the aquatic environment. III. Public health aspects, quality standards and legislation. *Science of the Total Environment*, **27** (2-3), 163-200.

Full Text: [S\Sci Tot Env27, 163.pdf](S/Sci%20Tot%20Env27,%20163.pdf)

Abstract: Literature on the health aspects and possible risks of the presence of organic micropollutants in water and waste waters is reviewed and the quality standards and legislation pertaining to certain organic compounds which have been promulgated by some countries and international organisations are assessed and compared. It is evident from the literature that different standards may be applied to waters which are designated for particular uses and that quality standards for protection of the aquatic environment (aquatic organisms) are generally more stringent than those applied to drinking water. Quality standards developed by different countries and organisations display a broad similarity in most cases, but differ where various approaches have been employed in determining the toxicity of and hazards presented by individual compounds. It is concluded that such legislation will become more comprehensive in the future, with the inclusion of more substances and recommendations for treatment procedures.

Fergusson, J.E. and Schroeder, R.J. (1985), Lead in house dust of christchurch, New Zealand: Sampling, levels and sources. *Science of the Total Environment*, **46** (1-4), 61-72.

Full Text: [1985\Sci Tot Env46, 61.pdf](1985/Sci%20Tot%20Env46,%2061.pdf)

Abstract: Lead in house dust was determined in different areas of Christchurch, New Zealand. The mean lead level in newer (post-1950) areas of the city was 460 μg g−1, whereas in older (pre-1950) areas it was 830 μg g−1. These levels also relate to the type of building material (brick or wood, respectively) and type of paint used (non-lead or lead paint, respectively). For the newer areas of the city, it was estimated that ~90% of the lead was derived from petrol additives (via street dust and aerosol), whereas in the older areas, ~50% of the lead was estimated to come from petrol lead and 45% from paint lead.

Cotruvo, J.A. (1985), Organic micropollutants in drinking water: An overview. *Science of the Total Environment*, **47**, 7-26.

Full Text: [S\Sci Tot Env47, 7.pdf](S/Sci%20Tot%20Env47,%207.pdf)

Abstract: Biological contamination is still the most significant public health risk from drinking water even in industrialized countries. High potential for organic chemical transport to drinking water continues to exist even with source protection because of the multitude of chemical types and quantities. Drinking water is usually not a unique source nor the most significant contributor to total exposure from synthetic organic chemicals but it might be one of the most controllable. The major public concern with drinking water contamination has been possible contribution to cancer risks from organic micropollutants. Even though the actual risks are probably small in most cases it is clearly within the public interest to prevent adulteration of water supplies and to protect their quality for the future so that these concerns or risks can be avoided. A risk assessment/management decision model is suggested which may assist the process of making rational assessments of these contamination problems and control decisions that consciously consider all of the available data in a consistent manner.

Toft, P. (1985), The control of organics in drinking water in Canada and the United States (standards, legislation and practice). *Science of the Total Environment*, **47**, 45-58.

Full Text: [S\Sci Tot Env47, 45.pdf](S/Sci%20Tot%20Env47,%2045.pdf)

Abstract: Both the United States and Canada have a federal form of government, but approaches used in the two countries to ensure the safety of drinking water supplies differ. The Environmental Protection Agency currently enforces regulations for 10 organic chemicals (including 6 pesticides) under the Safe Drinking Water Act and provides advice on others through its health advisory program. Canada, however, does not have similar legislation, but rather provides health-related guidelines for 21 organic chemicals (including 16 pesticides) which are used by the provincial agencies responsible for drinking water supplies. Both countries are in the process of revising their standards and will include a variety of additional synthetic organic chemicals. Where possible, standards are set using a calculated acceptable daily intake usually derived from animal feeding experiments. Procedures for setting standards for carcinogens involve a blend of risk estimation coupled with consideration of the feasibility of reducing the risk in light of socio-economic factors. Most drinking water treatment plans in North America utilize ‘conventional’ treatment. Some now employ modifications in order to minimize trihalomethane formation. A few use aeration or granular activated carbon to remove synthetic organic chemicals.

Hayes, R.B. (1988), Review of occupational epidemiology of chromium chemicals and respiratory cancer. *Science of the Total Environment*, **71** (3), 331-339.

Full Text: [S\Sci Tot Env71, 331.pdf](S/Sci%20Tot%20Env71,%20331.pdf)

Abstract: Several epidemiologic studies have investigated the association between cancer risk and employment in chromium producing and using industries. Strong and consistent associations have been found between employment in the primary chemical producing industry and the risk for respiratory cancer. Workers employed in chromate pigment production and possibly spray painters of chromate pigment paints appear to be at excess risk of respiratory cancer. Chrome platers may also be at excess risk, although the evidence is limited. A few studies indicate that chromium alloy welding may also be an exposure source of concern. Some studies of ferrochromium alloy workers have shown an excess risk for respiratory cancer, although the risk may in part be due to concomitant exposures. The evidence indicates that the hexavalent form of chromium is the primary agent of chromium carcinogenesis. Solubility and other characteristics of chromium compounds may also play a role in determining risk.

Bratakos, M.S., Zarifopoulos, T.F., Siskos, P.A. and Ioannou, P.V. (1988), Total selenium concentration in tap and bottled drinking-water and coastal waters of Greece. *Science of the Total Environment*, **76** (1), 49-54.

Full Text: [S\Sci Tot Env76, 49.pdf](S/Sci%20Tot%20Env76,%2049.pdf)

Abstract: The total selenium concentration in various waters from all over Greece was determined fluorimetrically. The concentration in most of the drinking water, either from the tap or bottled, was within the range 100–200 ng l−1 and showed no great seasonal fluctuations. Most Greeks receive 0.2–0.4 μg selenium per day from drinking water. Coastal surface water contains 100–250 ng Se l−1, while higher concentrations are found at locations regarded as polluted

Raghupathy, L., Harada, M., Ohno, H., Naganuma, A., Imura, N. and Doi, R. (1988), Methods of removing external metal contamination from hair samples for environmental monitoring. *Science of the Total Environment*, **77** (2-3), 141-151.

Full Text: [S\Sci Tot Env77, 141.pdf](S/Sci%20Tot%20Env77,%20141.pdf)

Abstract: Human exposure to trace elements has become a major environmental issue with the growing industrialization and urbanization around the world. Hair samples are the most conveniently obtainable biopsy material and they have been identified as good indicators of the metal pollution in an environment. For their effective use, however, it is necessary to exclude the effect of external contamination of the hair surface by metals. The present investigation compares the different methods of washing hair samples prior to further treatment for elemental analysis. Deionized water, solvents (acetone, ether and carbon tetrachloride), non-ionic detergent, ionic detergent (sodium lauryl sulfate), chelating agent (EDTA-2Na), ultrasonics and combinations of these agents were used in the experiments. EDTA was found to be the most suitable of these washing agents for removing external contaminant metals. Further elucidation, however, is needed before a standard method of hair washing can be established.

Doi, R., Raghupathy, L., Ohno, H., Naganuma, A., Imura, N. and Harada, M. (1988), A study of the sources of external metal contamination of hair. *Science of the Total Environment*, **77** (2-3), 153-161.

Full Text: [S\Sci Tot Env77, 153.pdf](S/Sci%20Tot%20Env77,%20153.pdf)

Abstract: Sources of external metal contamination of hair were examined experimentally by exposing hair samples to soil, hot water from a water boiler for domestic use and household dust and fumes in a kitchen. Copper concentration in the hair increased markedly only when the hair was exposed to hot water from the boiler. Iron concentration in the hair increased markedly after exposure to wet soil, and increased slightly after exposure to hot water from the boiler. There was a slight decrease in zinc in the hair after exposure to wet or moist soil, and a significant increase after exposure to hot water from the boiler. When the hair was exposed to household dust and fumes, zinc showed a slight increase but copper and iron showed no change at all. The experiments with soil demonstrated the importance of water in the movement of iron from soil to hair and the role played in this process by biological factors such as soil bacteria.

Admiraal, W., de Ruyter van Steveninck, E.D. and de Kruijf, H.A. (1989), Environmental stress in five aquatic ecosystems in the floodplain of the River Rhine. *Science of the Total Environment*, **78**, 59-75.

Full Text: [S\Sci Tot Env78, 59.pdf](S/Sci%20Tot%20Env78,%2059.pdf)

Abstract: General theories of stress ecology were applied to aquatic communities in the floodplain of the polluted River Rhine. These communities inhabited (i) a brackish section of the Ems-Dollard estuary with large intertidal flats, (II) the coastal waters of the North Sea and the adjacent Wadden Sea, (iii) a former estuary of the Rivers Rhine and Meuse: the newly endiked Lake Grevelingen, (iv) the shallow Loosdrecht Lakes, and (v) the lower River Rhine. These systems are characterized by natural perturbations, such as suspension of sediments and flushing of the shallow waters. Organic pollution, eutrophication and chemical pollution reinforce the natural tendency to severe selection in the communities, in extreme cases leading to an abundance of small and opportunistic species participating in relatively simple food chains. Signs of ecosystem distress, as defined by Rapport et al., were detectable in all five ecosystems. The application of the theory of Odum et al. on stimulation and inhibition of ecosystems helped in identifying the positive impact of man. The role of stress in natural aquatic ecosystems in the delta, together with observations on ecological recovery under reduced man-made perturbation, suggest that there is scope for effective water management that exploits the resilience of these ecosystems.

Shrestha, K.P. and Ruiz de Quilarque, X. (1989), A preliminary study of mercury contamination in the surface soil and river sediment of the Roscio District, Bolivar State, Venezuela. *Science of the Total Environment*, **79** (3), 233-239.

Full Text: [S\Sci Tot Env79, 233.pdf](S/Sci%20Tot%20Env79,%20233.pdf)

Abstract: The present study constitutes a comparison of mercury in surface soil and river sediments of a contaminated and an uncontaminated area of Venezuela. In the contaminated area, gold prospectors have been using mercury to separate gold from auriferous sand and rock powders for many years. The baseline level of mercury in the river sediments of the uncontaminated area (Manzanares River, Sucre State) was 0.06 micrograms g-1, while in the contaminated area in the Roscio District of Bolivar State the concentration varied from 0.12 to 129 micrograms g-1. In the river sediments the average level of mercury was 0.71 micrograms g-1 and in the surface soil of the working areas 37 micrograms g-1, which shows a significant increase in the mercury level in the contaminated areas. This high level of mercury in the soil and sediments constitutes a serious risk to public health in the contaminated area, where the local people use the water for drinking and other domestic purposes, moreover, they also consume fish from these rivers.

Nawar, S.S. and Doma, H.S. (1989), Removal of dyes from effluents using low-cost agricultural by-products. *Science of the Total Environment*, **79** (3) 271-279.

Full Text: [S\Sci Tot Env79, 271.pdf](S/Sci%20Tot%20Env79,%20271.pdf)

Abstract: The adsorption capacity of agricultural by-products, namely peat and rice hulls, for acidic and basic dyes has been investigated and compared with that of activated carbon. The effect of contact time, pH and adsorbent particle size were studied. Fixed-bed flow experiments were performed to simulate industrial conditions on a small scale. Economic evaluation indicates that peat and rice hulls have high adsorptive capacities, as well as being very cheap.

Kronberg, L. and Christman, R.F. (1989), Chemistry of mutagenic by-products of water chlorination. *Science of the Total Environment*, **81-82**, 219-230.

Full Text: [S\Sci Tot Env81-82, 219.pdf](S/Sci%20Tot%20Env81-82,%20219.pdf)

Abstract: The strong Ames mutagen 3-chloro-4-(dichloromethyl)-5-hydroxy-2 (5H)-furanone (MX) and its geometric isomer E-2-chloro-3-(dichloromethyl)-4-oxobutenoic acid (E-MX) have been shown to be present in chlorinated drinking waters. MX accounts for approximately 30% and E-MX for a few percent of the overall mutagenicity. MX and E-MX are unstable in water and undergo both pH dependent isomerization (MX in equilibrium E-MX) and hydrolytic degradation. Alternative methods of disinfection have been found to produce mutagenicity, and MX and E-MX but to a lesser extent than disinfection with chlorine. The MX analogues 3-chloro-4-(dichloromethyl)-2 (5H)-furanone (red-MX) and 2-chloro-3-(dichloromethyl)-2-butenedioic acid (ox-MX) have also been identified in chlorinated water. However, the relatively low mutagenicity of these compounds suggests that their contribution to the overall mutagenicity of chlorinated water is of only moderate significance.

Hongve, D. (1989), Anion exchange as a potential method for removal of humus in drinking water treatment. *Science of the Total Environment*, **81-82**, 249-256.

Full Text: [S\Sci Tot Env81-82, 249.pdf](S/Sci%20Tot%20Env81-82,%20249.pdf)

Abstract: Removal of humus by anionic exchange is a potential process for small waterworks in Norway. The interaction between humic substances and a strong base anion exchange resin has been studied and the results are used for characterization of the humic substances. Thirty per cent of the organic matter were removed from the water during the first six seconds of contact with the resin. This fraction had a higher negative charge and lower molecular weight than the average for the water sample. With increasing contact time, fractions with a decreasing charge density and increasing colour and molecular weight were removed. The unabsorbed DOC fraction had a net positive charge. The anion exchange process results in a reduction in pH, and dissolved iron and aluminium are transformed from organic complexes to inorganic species. This may represent an obstacle for the practical use of the process.

Gjessing, E.T., Riise, G., Petersen, R.C. and Andruchow, E. (1989), Bioavailability of aluminium in the presence of humic substances at low and moderate pH. *Science of the Total Environment*, **81-82**, 683-690.

Full Text: [S\Sci Tot Env81-82, 683.pdf](S/Sci%20Tot%20Env81-82,%20683.pdf)

Abstract: Fish kills have been observed in lakes with low pH and high Al content. The monomeric inorganic Al seems to be the most acute toxic fraction. Humic lake waters, situated in acidified areas, often have high values of aluminium. However, the fraction of Al bound to humus is regarded as a relatively nontoxic form of Al. As pH is decreasing, the physical and chemical properties of humus change. The molecular size, electronegativity and colour decrease. An important question in this matter is the potential change in bioavailability of ‘Al-humus’ as pH decreases. The bioavailability of the Al-humus complex was studied, in relation to surface water acidification and in relation to drinking water and human health. The work is based on the octanol/water partition coefficient (Khow), estimated by measuring the UV absorption at 254 nm. Al concentration is determined in the water phase and in the octanol phase. The results show that the amount of organic material soluble in the octanol phase relative to the amount in the aqueous phase increases with decreasing pH, while no Al is detected in the octanol phase. It is concluded that Al is only weakly bound to humus and consequently Al complexed with humus is of minor concern in bioaccumulation.

Markert, B. and Weckert, V. (1989), Use of *Polytrichum* *formosum* (moss) as a passive biomonitor for heavy metal pollution (cadmium, copper, lead and zinc). *Science of the Total Environment*, **86** (3), 289-294.

Full Text: [S\Sci Tot Env86, 289.pdf](S/Sci%20Tot%20Env86,%20289.pdf)

Abstract: After sampling over regular intervals from 1985 to 1987 the heavy metals Cd, Cu, Pb and Zn were quantitatively determined by atomic emission spectrometry/inductively coupled plasma in above-ground parts of the moss *Polytrichum formosum* (Hedw.). All metals present a typical summer-winter oscillation (seasonal variation), which is much greater than the ‘inter-stand’ variation of *Polytrichum formosum* within the forest ecosystem under investigation. To obtain comparable results on a regional or global scale it is suggested to collect all samples of *Polytrichum formosum* for biomonitoring purposes in the last week of September.

Notes: highly cited

? Nriagu, J.O. (1990), The rise and fall of leaded gasoline. *Science of the Total Environment*, **92**, 13-28.

Full Text: [1990\Sci Tot Env92, 13.pdf](1990/Sci%20Tot%20Env92,%2013.pdf)

Ishimaru, T., Inouye, H. and Morioka, T. (1990), Risk assessment of drinking water in a reservoir contaminated by PAH’s originated from road traffic. *Science of the Total Environment*, **93**, 125-130.

Full Text: [S\Sci Tot Env93, 125.pdf](S/Sci%20Tot%20Env93,%20125.pdf)

Abstract: The loads of Polycyclic Aromatic Hydrocarbons (PAHs) originating from road traffic were measured and in units of per vehicle per meter was estimated as follows: 0.07 ng/veh.m for Benzo[a]pyrene, and 0.83 ng/veh.m for Dibenzanthracene and so on, and 5.77 ng/veh.m for total PAHs. This unit is applied to risk estimation of drinking water in a reservoir where it is planned to construct a new high way the near future, and the concentration in the reservoir water is estimated to be 3.3-101 ng/l for individual PAH’s. Assuming standard oral exposure to PAHs in raw water for drinking water supply, the estimated lifetime risk of carcinogenesis was less than 1 in 10 (6), which is not considered significant.

Stoewsand, G.S., Anderson, J.L., Bache, C.A. and Lisk, D.J. (1990), Cadmium deposition and hepatic-microsomal activity in mice fed swiss-chard grown on municipal incinerator refuse ash. *Science of the Total Environment*, **94** (3), 253-259.

Full Text: [S\Sci Tot Env94, 253.pdf](S/Sci%20Tot%20Env94,%20253.pdf)

Abstract: Incineration of municipal solid waste results in the production of millions of tons of ash that may be typically high in heavy metals such as cadmium. Disposal of such ash in landfills capped with soil could lead to absorption of such metals by plants and deposition in foraging animal tissues. In this study, weanling, male mice were fed swiss chard that was grown on soil amended with 10% w/w municipal incinerator refuse ash. Cadmium was taken up by the swiss chard (8.15 ppm, dry wt). The mice fed diets containing 25% of ash-grown chard showed mean kidney and liver concentrations of cadmium (ppm, dry wt), respectively, of 2.80±0.30 and 0.45±0.03. Control mice fed soil-grown chard showed significantly lower kidney and liver concentrations of cadmium, i.e. 0.39±0.02 and 0.05±0.00 ppm. Since refuse incinerator ashes may contain various organic toxicants that can be hepatic microsomal inducers, the relative liver weights and hepatic microsomal aminopyrine *N*-demethylase and *p*-nitroanisole *O*-demethylase activities of mice fed control or ash-grown chard were measured. No consistent increases in these latter parameters were found in the ash-grown chard fed mice as compared with the control animals.

Neuberger, J.S., Mulhall, M., Pomatto, M.C., Sheverbush, J. and Hassanein, R.S. (1990), Health problems in Galena, Kansas: A heavy metal mining Superfund site. *Science of the Total Environment*, **94** (3), 261-72

Full Text: [S\Sci Tot Env94, 261.pdf](S/Sci%20Tot%20Env94,%20261.pdf)

Abstract: Health problems at a heavy metal mining Superfund site were surveyed using prevalence information from 1980-85. Current environmental exposures include lead and cadmium in drinking water, mine wastes, and surface soils. Age-and sex-specific illness rates in whites in an exposed town (Galena) were compared with similar rates in two control towns. Multivariate analyses of morbidity data examined statistically significant risk factors for relevant illness in the three towns. Mortality rates for 1980-85 for white residents of Galena and for the U.S. were compared using univariate analysis. Among residents of the three towns who had lived there at least 5 years prior to 1980, there was either a statistically significant or borderline excess reported prevalence in Galena of chronic kidney disease (females aged greater than or equal to 65), heart disease (females aged greater than or equal to 45), skin cancer (males aged 45-64), and anemia (females aged 45-64). Multivariate analyses revealed statistically significant associations of stroke, chronic kidney disease, hypertension, heart disease, skin cancer, and anemia with variables related to Galena exposure. Personal physicians were contacted to confirm the information provided by the subjects, validity was good for all reported illnesses except chronic kidney disease. A statistically significant excess of deaths from hypertensive disease (females aged greater than or equal to 65), ischemic heart disease (males and females aged greater than or equal to 65), and stroke (females aged greater than or equal to 65) was found in residents of Galena City. This study confirms that environmental agents in Galena are associated with, and may have contributed to, the causation of several chronic diseases in residents of this community. Further studies are recommended.

Flaten, T.P. (1991), A nationwide survey of the chemical-composition of drinking-water in norway. *Science of the Total Environment*, **102**, 35-73.

Full Text: [S\Sci Tot Env102, 35.pdf](S/Sci%20Tot%20Env102,%2035.pdf)

Abstract: Water samples were collected from 384 waterworks that supply 70.9% of the Norwegian population. The samples were collected after water treatment and were analysed for 30 constituents. Although most constituents show wide concentration ranges, Norwegian drinking water is generally soft. The median values obtained are: 0.88 mg Si l-1, 0.06 mg Al l-1, 47-mu-gFe l-1, 0.69 mg Mg l-1, 2.9 mg Ca l-1, 3.8 mg Na l-1, 6 µg Mn l-1, 12 µg Cu l-1, 14 µg Zn l-1, 9 µg Ba l-1, 15 µg Sr l-1, 0.14 mg Kl-1, 58 µg F l-1, 6.4 mg Cl l-1, 11 µg Br l-1, 0.46 mg NO3 l-1, 5.3 mg SO42-l-1, 2.4 mg TOCl-1, 6.8 (pH), 50 µS cm-1 (conductivity) and 11 mg Pt l-1 (colour). Titanium, Pb, Ni, Co, V, Mo, Cd, Be and Li were seldom or never quantified, due to insufficient sensitivity of the ICP (inductively coupled plasma) method. Norwegian quality criteria, which exist for 17 of the constituents examined, are generally fulfilled, indicating that the chemical quality of drinking water, by the large, is good in Norway. For Fe, Ca, Mn, Cu, pH, TOC and colour, however, the norms for good drinking water are exceeded in more than 9% of the samples, reflecting two of the major problems associated with Norwegian drinking water supplies (i) many water sources contain high concentrations of humic substances, (II) in large parts of the country, the waters are soft and acidic, and therefore corrosive towards pipes, plumbing and other installations. Most constituents show marked regional distribution patterns, which are discussed in the light of different mechanisms contributing to the chemical composition of drinking water, namely: chemical weathering of mineral matter, atmospheric supply of salt particles from the sea, anthropogenic pollution (including acid precipitation), corrosion of water pipes and plumbing, water treatment, decomposition of organic matter, and hydrological differences.

Keywords: Small Norwegian Lakes, Natural Fresh Waters, Trace-Metals, Acid Precipitation, Surface, Lead, Aluminum, Bromide, Health, Canada

Wondergem, E. and van Dijk Looijaard, A.M. (1991), Chlorine dioxide as a post-disinfectant for Dutch drinking water. *Science of the Total Environment*, **102**, 101-112.

Full Text: [S\Sci Tot Env102, 101.pdf](S/Sci%20Tot%20Env102,%20101.pdf)

Abstract: Chlorine dioxide has some important advantages over chlorine with respect to water quality (no formation of trihalomethanes, no impairment of taste and no odor) and stability when used for oxidation/disinfection of drinking water. In this paper, results are presented of experiments into the consumption and reaction kinetics of chlorine dioxide in a number of (drinking) waters in The Netherlands. It was found that chlorine dioxide consumption is related to the dissolved oxygen content (DOC) of the water and the reaction time. Water samples from a plant that applied ozonation and activated carbon filtration had a very low chlorine dioxide consumption. Other water quality parameters, including pH and CO32-, did not have any influence on consumption. The temporary advised Dutch guidelines of 0.2 mg l-1 (dosage) is sufficient for activated carbon treated water. For other Dutch drinking waters, however, none of the 0.2 mg l-1 chlorine dioxide remained after a reaction time of 10 min, as was also found for the water of Dutch pumping stations where chlorine dioxide is at present used for disinfection.

Lloyd, O.L., Lloyd, M.M., Williams, F.L., McKenzie, A. and Hay, A. (1991), Toxicity from ragwort and fat cow syndrome, or from industrial chemicals: The value of epidemiological analysis for interpreting clinico-pathological findings. *Science of the Total Environment*, **106** (1-2), 83-96.

Full Text: [S\Sci Tot Env106, 83.pdf](S/Sci%20Tot%20Env106,%2083.pdf)

Abstract: When livestock in close proximity to industries develop signs of ill-defined disease, toxic effects from industrial pollution should be considered in the differential diagnosis. In establishing the final diagnosis, epidemiological methods should be applied to supplement the clinical and pathological techniques. This viewpoint is illustrated by two case-histories describing episodes of cattle disease in central Scotland. A long-established and successful dairy herd in central Scotland sustained severe morbidity and mortality amongst animals which had grazed on a field beside a recently established dump which contained wastes from a chemical waste incinerator. An official investigation concluded that the episode of disease was the result of ragwort poisoning, this diagnosis was reached on clinical and pathological grounds only. A similarly unexpected and severe epidemic occurred a few years later in another dairy herd, about 1 km further away from that incinerator (which was also within 100 m of a municipal incinerator). The official investigation, which again focused on clinical and pathological criteria, led to the diagnosis of fat cow syndrome. In the first episode, contaminated water drained from the chemical waste dump on to the cows’ field, in the second episode, the relevant field was affected by airborne pollution from the two waste incinerators mentioned earlier. In both episodes, the epidemiological features, which were not examined systematically by the original investigators, were consistent with the hypothesis that these episodes resulted from exposures to toxic contaminants.

Augustin, J. and Zejda, R. (1991), Cancer incidence and geochemical factors in the environment. *Science of the Total Environment*, **106** (1-2), 155-163.

Full Text: [S\Sci Tot Env106, 155.pdf](S/Sci%20Tot%20Env106,%20155.pdf)

Abstract: Between 1961 and 1987, 9875 cases of cancer were registered in the district of Zdar nad Sazavou in southern Czechoslovakia, this district covers an area of 1627 km2 and has a population of 125,000 living within 197 identifiable communities. The age-standardized cancer incidence (standardized incidence rate, SIR) for selected cancers was calculated for each of the 197 communities. Five distinct geological areas were identified in the district, the percentages of the communities with a high incidence of cancer in each of these five areas were compared and statistically tested. More than 95% of the communities with a significantly high incidence of cancers of the digestive organs, lymphomas, leukaemias and all childhood cancers were situated in the areas containing tectonic faults or geological substrata which allowed radioactive elements (such as U, Rn, Co and Th) and heavy metals (for example, Pb, Zn, Cu and Cd) to intrude to the surface. Important quantities of heavy metals and radioactivity were found in drinking water, air (fall-out, including dust) and aerosols. The role of geochemical factors in the environment as possible causes of the high incidence of some cancers is discussed.

de la Torre, M.A., Gomez-Alarcon, G., Melgarejo, P. and Saiz-Jimenez, C. (1991), Fungi in weathered sandstone from Salamanca cathedral, Spain. *Science of the Total Environment*, **107**, 159-168.

Full Text: [S\Sci Tot Env107, 159.pdf](S/Sci%20Tot%20Env107,%20159.pdf)

Abstract: Fungi are usually present on weathered sandstone from the cathedral of Salamanca, Spain, as demonstrated by the isolation of 26 different species. The principal genera of fungi isolated were *Penicillium*, Phoma, Cladosporium, Trichoderma and Fusarium. *Penicillium* and Trichoderma are acid-producing species, whereas Cladosporium and Phoma do not acidify the medium. Fusarium species are both acid-and non-acid producing. These fungi were most abundant on the facades with evident algal growth, from which the fungi appear to derive the organic matter needed as a carbon source.

Lin, L.Q. (1991), Indoor radon measurements in the Beijing area. *Science of the Total Environment*, **107**, 255-264.

Full Text: [S\Sci Tot Env107, 255.pdf](S/Sci%20Tot%20Env107,%20255.pdf)

Abstract: Average indoor air radon concentration of 30 Bq/m3 was determined in various types of dwellings in the Beijing area using activated carbon detectors. In this study, several related factors were also investigated: radon area exhalation rates of 136 building materials and from soil surfaces, Ra-226 contents of 143 soil samples, 34 building materials and 28 coal samples, and radon concentrations in gaseous fuel, outdoor air and drinking water. The magnitude and relative importance of different sources in terms of indoor radon are discussed, compared and evaluated. The results show that the underlying soil and building materials are important sources of indoor radon. Cracks in floors or walls are major pathways for the entry of radon into houses. Measurements of the annual effective dose equivalent from radon daughters for different types of aboveground and underground buildings gave average values of 1.1 and 1.5 mSv, respectively.

Silkowski, M.A., Smith, S.R. and Plewa, M.J. (1992), Analysis of the genotoxicity of municipal solid-waste incinerator ash. *Science of the Total Environment*, **111** (2-3), 109-124.

Full Text: [S\Sci Tot Env111, 109.pdf](S/Sci%20Tot%20Env111,%20109.pdf)

Abstract: Combined bottom and fly ash obtained from a Chicago, IL, municipal solid waste incinerator (MSWI) was extracted with organic solvents, water or acidified water. The mean amounts of organic material isolated from each extraction procedure were 688.2, 91.8 and 167.7-mu-g/g MSWI ash. These extracts were evaluated for toxicity and mutagenicity in Salmonella typhimurium strains TA98 and TA100. We developed and calibrated a micropreincubation assay to evaluate small concentrations of the organic extracts. No direct-acting mutagens were found, however the acid-treated aqueous extracts were toxic. Materials isolated with methylene chloride methanol were mutagenic after hepatic microsomal activation (S9). The mutagenic potencies of the organic extract normalized to a per gram ash basis was the induction of 103.46 revertants in TA98 and 247.5 revertants in TA100. The aqueous extracts were neither toxic nor mutagenic. However, the acid-treated aqueous extract was mutagenic to TA1OO. The organic material isolated from the acidic extract had an induced mutagenic potency of 44.2 revertants/mg extract. Normalizing these data indicate a mutagenic potency of 7.4 revertants/g MSWI ash leached.

Keywords: Arteriosclerotic Plaque Development, Polynuclear Aromatic-Hydrocarbons, Fly-Ash, Refuse Incinerators, Mutagenicity Test, Perspective, Emissions, Exposure, Dioxin, Water

Inbar, Y., Hadar, Y. and Chen, Y. (1992), Characterization of humic substances formed during the composting of solid wastes from wineries. *Science of the Total Environment*, **113** (1-2), 35-48.

Full Text: [S\Sci Tot Env113, 35.pdf](S/Sci%20Tot%20Env113,%2035.pdf)

Abstract: Humic substance (HS) were extracted from grape marc (GM) compost (the residues of wine processing) at various stages of decomposition. Chemical analyses, carbon-13 nuclear magnetic resonance (C-13-NMR) acquired with cross-polarization magic-angle spinning (CPMAS) and Fourier-transform infrared (FTIR) spectroscopy measurements were performed on the purified humic acids (HAs). The total level of HS slightly decreased (from 390 to 310 g kg-1 OM) during the composting process, HAs and fulvic acid concentrations did not change (250 g kg-1 OM and 60 g kg-1 OM, respectively). However, the level of the nonhumic fraction declined rapidly (from 100 to 40 g kg-1 OM). The ratios between the various HS fractions were calculated and found to be useful humification indices which changed significantly during the process. These ratios were exponentially and significantly correlated with either the composting time or C/N ratio. Although the elemental composition of the GM-HAs did not change during the composting process, an increase in aliphatic C and carboxyl groups, a decrease in phenolic OH and total aromaticity as well as a decline in polysaccharide levels were recorded. The HAs extracted from GM exhibited similar features to peat-HA. Humic acids extracted from GM changed both quantitatively and qualitatively. The spectroscopic characteristics of the HAs resembled these of peat HAs and young forms of soil HAs. On the basis of this study it may be concluded that CPMAS C-13-NMR supported by FTIR significantly improves the characterization of HAs extracted from composts and that several maturity criteria for composts may be derived from sequential quantitative extraction and fractionation of HS.

Keywords: Humic Acids, Composting, Grape Marc, C-13 Cpmas NMR, Organic-Matter, Humification, Peat, Media, Acids

Hibino, M., Matsuda, H., Sato, T., Ose, Y., Nagase, H. and Kito, H. (1992), Generation of mutagenicity by ozonation of humic substances’ components. *Science of the Total Environment*, **116** (1-2), 1-13.

Full Text: [S\Sci Tot Env116, 1.pdf](S/Sci%20Tot%20Env116,%201.pdf)

Abstract: Components of humic substances, such as vanillin, syringaldehyde, vanillic acid and di-n-butylphtalate, were ozonated and subjected to the mutagenicity assay using Salmonella typhimurium TA 98 and 100 with and without S9 mix. The strong mutagenic activity was found on all components except di-n-butylphtalate by strain TA 100 with and without S9 mix. Substances with strong mutagenic activity in ozonated vanillin were water-soluble and were slightly extracted with benzene, dichloromethane and ethyl acetate. Following gel chromatography on Sephadex G-10, the strong mutagens generated by ozonation were found with molecular weights greater than 300.

Pollard, S.J.T., Fowler, G.D., Sollars, C.J. and Perry, R. (1992), Low-cost adsorbents for waste and wastewater treatment: A review. *Science of the Total Environment*, **116**, 31-52.

Full Text: [S\Sci Tot Env116, 31.pdf](S/Sci%20Tot%20Env116,%2031.pdf)

Abstract: The recent research interest in low-cost alternatives to activated carbon for waste and wastewater treatment is reviewed. An examination of the selection criteria and activation methods for the preparation of active carbon is followed by a critical assessment of low-cost adsorbents prepared from carbonaceous industrial wastes, agricultural by-products and mineral-derived sources. Emphasis is given to in situ reuse applications where stated in the literature and rudimentary economic analyses provided, where available, for comparative operations with commercial activated carbon.

Keywords: Adsorbants, Carbonaceous, Wastes, Waste U-Use, Wastewater Trea

Sánchez, A.G., Antona, J.F. and Urrutia, M. (1992), Geochemical prospection of cadmium in a high incidence area of prostate cancer, Sierra de Gata, Salamanca, Spain. *Science of the Total Environment*, **116** (3), 243-251.

Full Text: [S\Sci Tot Env116, 234.pdf](S/Sci%20Tot%20Env116,%20234.pdf)

Abstract: A high incidence of prostate cancer was observed in some areas of Salamanca province, Spain. After excluding the most common etiological factors as the cause, it is concluded that the only possible risk factor must be due to the presence of some environmental carcinogen. In view of the etiological relationship between Cd and the pathological state, a study was carried out on the geochemistry of this element in the area. Anomalous amounts of Cd were found in stream sediments. This anomaly does not correspond to human activity, but rather to high regional amounts of cadmium in the substrate. Thus, the contents of Cd in soils developed over substrates containing naturally-occurring anomalous amounts of cadmium and the concentration in underground waters should be considered as a risk factor in this area.

Keywords: Geochemistry, Cadmium, Prostate Cancer, Spain

Kozar, S., Bilinski, H., Branica, M. and Schwuger, M.J. (1992), Adsorption of Cd(II) and Pb(II) on bentonite under estuarine and seawater conditions. *Science of the Total Environment*, **121**, 203-216.

Full Text: [S\Sci Tot Env121, 203.pdf](S/Sci%20Tot%20Env121,%20203.pdf)

Abstract: The adsorption of cadmium and lead ions to natural iron bentonite has been studied in seawater of various dilutions. Both ions are well adsorbed under freshwater conditions. However, negligible adsorption of cadmium, as distinguished from lead ions was observed under seawater conditions. The influence of particular seawater constituents on the decrease in cadmium adsorption has been studied. Among the inorganic ions of seawater, magnesium and chloride show the greatest inhibiting effect. The inhibition of cadmium adsorption decreases in the order Mg2+ > Ca2+ > Sr2+. This is at variance with the ion-exchange theory and is probably due to the significant difference in concentration ratios of these elements found in seawater (Mg, 0.053, Ca, 0.010, Sr, 0.00015 mol dm−3). Organic ligands of marine origin, as well as selected sugars, amino sugars and amino acids, decrease cadmium adsorption, while artificial surface active substances (Triton X-100, dodecyl benzene sulphonic acid-sodium salt, dodecyl piridinium chloride), added in concentrations lower than the critical micellar concentration, show no effect. The experiments performed in this work suggest the mechanism of a self-purification ability of river water containing suspended bentonite. However, upon entering the sea, cadmium will be remobilized from the particles of the organically coated bentonite.

Keywords: Cadmium, Lead, Adsorption, Bentonite, Model Electrolytes, Sea Water

Sukasem, P. and Tabucanon, M.S. (1993), Monitoring heavy metals in the Gulf of Thailand using mussel watch approach. *Science of the Total Environment*, **139-140**, 297-305.

Full Text: [S\Sci Tot Env139-140, 297.pdf](S/Sci%20Tot%20Env139-140,%20297.pdf)

Abstract: Concentration of zinc, manganese, copper, chromium, nickel and cadmium were determined in the whole soft parts of the mussel, Perna viridis, collected along the coast of the Gulf of Thailand. Mussels were sampled from 10 locations, during 1989-1990, following an earlier study in 1986. The trends of accumulations of investigated metals in the mussel were not higher than the previous study, except for the concentration of manganese and nickel. The levels of manganese and nickel in the mussel in 1989 and in 1990 were much higher than those reported previously for 1986. In addition, the level of cadmium, manganese and chromium in mussels from the western coast of the Gulf was higher than that from the other parts of the Gulf. However, the levels of such metals were within the acceptable limits with respect to the public health standards.

Mravcová, A., Jírová, D., Jancí, H. and Lener, J. (1993), Effects of orally administered vanadium on the immune system and bone metabolism in experimental animals. *Science of the Total Environment*, **Pt 1**, 663-669, Suppl.

Abstract: Experiments were carried out to gain more information on the effects of long term exposure to low doses of vanadium administered to mice and rats in drinking water. The selective immunotoxic effects of vanadium were depression of phagocytosis, splenotoxicity, enlargement of spleen, elevation of peripheral blood leucocytes and T and B cell activation. Vanadium accumulates in hard tissues and influences the mineralisation of epiphyseal cartilage. This effect is obviously evident in young animals. Significant differences in vanadium concentration were found between young and adult animals.

Luttik, R., Romijn, C.A. and Canton, J.H. (1993), Presentation of a general algorithm to include secondary poisoning in effect assessment. *Science of the Total Environment*, **Pt 2**, 1491-500, Suppl.

Abstract: A general algorithm for effect assessment on secondary poisoning for birds and mammals is presented. This algorithm (Maximum Permissible Concentration = NOECbird/mammal/BCF) was drawn up by analysing an aquatic food chain (water--fish--bird or mammal) and a terrestrial food chain (soil--worm--bird or mammal). NOECs and bioconcentration factors (BCFs) were collected for a set of selected compounds: lindane, dieldrin, cadmium and mercury in both water and soil, PCB153 only in water and DDT and PCP only in soil. BCFs for the terrestrial pathway are frequently < 1 and rarely above 10, though for the aquatic pathway BCFs up to 10 (4) were found for the same compounds. By calculating, M.P., Cs for fish-eaters and comparing these to, M.P., Cs calculated for aquatic organisms, secondary poisoning could be a critical pathway for methyl-mercury and PCB153. For lindane the conclusion depends on whether a separate or combined data set is chosen for birds and mammals. By calculating, M.P., Cs for a standard soil situation and comparing these to, M.P., Cs for terrestrial organisms, secondary poisoning could be a critical pathway for cadmium and methyl-mercury.

Ogunsola, O.J., Oluwole, A.F., Asubiojo, O.I., Olaniyi, H.B., Akeredolu, F.A., Akanle, O.A., Spyrou, N.M., Ward, N.I. and Ruck, W. (1994), Traffic pollution: Preliminary elemental characterisation of roadside dust in Lagos, Nigeria. *Science of the Total Environment*, **146-147**, 175-184.

Full Text: [S\Sci Tot Env146-147, 175.pdf](S/Sci%20Tot%20Env146-147,%20175.pdf)

Abstract: Roadside dust collected from different parts of Lagos metropolis were analysed for heavy metals and other trace elements using a combination of instrumental neutron activation analysis (INAA), inductively coupled plasma-optical emission spectrometry (ICP-OES), and flame atomic absorption spectrometry (FAAS). The results show a positive correlation of the concentration of Pb and some other vehicular emission-related elements with the traffic density. Automotive emission was also found to be the main contributor to Pb concentration in the roadside dust but some elements which hitherto have been linked with automotive emission, such as cadmium and nickel, did not show any strong correlation with traffic density.

Keywords: Automotive Emissions, Lead, Toxic Heavy Metals, Roadside Dust

Iwami, O., Watanabe, T., Moon, C.S., Nakatsuka, H. and Ikeda, M. (1994), Motor neuron disease on the Kii Peninsula of Japan: Excess manganese intake from food coupled with low magnesium in drinking water as a risk factor. *Science of the Total Environment*, **149** (1-2), 121-135.

Full Text: [S\Sci Tot Env149, 121.pdf](S/Sci%20Tot%20Env149,%20121.pdf)

Abstract: To identify important risk factors of motor neuron disease (MND) in a focus (Hohara) on the Kii peninsula of Japan, 24-h dietary duplicates, rice, drinking water, and soils were analysed for metals in Hohara and control areas. The manganese content in 24-h food in Hohara was significantly (P < 0.01) higher than that in the remote control areas. The incidence of MND in Hohara was well explained by the two parameters, manganese content in food and the magnesium concentration in drinking water (r2 = 0.99), suggesting that MND in this focus can be understood as a result of excess intake of manganese from food coupled with low intake of magnesium from drinking water. The reference to epidemiology and occupational medicine supports this conclusion. The crude annual MND incidence per 105 population in other foci may be predicted as MND = eαln[β(Mn in food)γ/(Mg in water)], where α is 5.389-5.748, β is 0.170-0.166, and γ is 1.239-1.226.

Malliou, E., Loizidou, M. and Spyrellis, N. (1994), Uptake of lead and cadmium by clinoptilolite. *Science of the Total Environment*, **149** (3), 139-144.

Full Text: [S\Sci Tot Env149, 139.pdf](S/Sci%20Tot%20Env149,%20139.pdf)

Abstract: The ion exchange systems of lead and cadmium, using the zeolite cinlinoptilolite, were examined. The metal uptake is increased with increasing temperature. At low temperatures the exchange of lead is mainly with the sodium ions but at higher temperatures potassium present in the zeolite lattice can be replaced, increasing the metal uptake. In the case of cadmium, the exchange occurs only with sodium ions, irrespective of the temperature of the solution. The zeolite particle size influences significantly the metal uptake. An increase is observed with decreasing particLe size. From the experimental results the diffusion coefficients and activation energies of the ion exchange systems are calculated.

Keywords: Metal Removal, Metal Uptake, Ion Exchange, Zeolites, Lead, Cadmium, Natural Zeolites, Exchange

Lauwerys, R. and Lison, D. (1994), Health risks associated with cobalt exposure: An overview. *Science of the Total Environment*, **150** (1-3), 1-6.

Full Text: [S\Sci Tot Env150, 1.pdf](S/Sci%20Tot%20Env150,%201.pdf)

Abstract: Cobalt is an essential oligoelement which enters in the composition of vitamin B12. For the general population, food and beverages represent the main source of cobalt exposure. Traces of cobalt are also present in cement and various household products. In industry, the potential for exposure to cobalt is particularly important during the production of cobalt powder, the production, processing and use of hard metals, the polishing of diamonds with cobalt containing disks and the processing of cobalt alloys. Except in the production of cobalt powders, these activities involve exposure not only to cobalt but also to other substances such as tungsten carbide, iron and diamond which may modulate the biological reactivity of cobalt. Cobalt salts are used for the preparation of enamels and pigments. Cobalt is mainly absorbed from the pulmonary and the gastrointestinal tracts. Absorption through the skin can occur but is low. Concomitant exposure to tungsten carbide increases the pulmonary absorption rate of cobalt metal. Cobalt is not a cumulative toxin and is mainly excreted in urine and to a lesser extent via faeces. Cobalt in blood and urine mainly reflects recent exposure. In the past, outbreaks of cardiomyopathy occurred among heavy consumers of cobalt fortified beer. It is likely that poor nutrition and ethanol had played a synergistic role. Toxic manifestations, however, have mainly been reported following inhalation of cobalt containing dusts in industry. The two main target organs are the skin and the respiratory tract. Cobalt itself may cause allergic dermatitis, rhinitis and asthma. Specific IgE against a complex of cobalt with albumin can sometimes be shown and a bronchial provocation test with a cobalt salt may be positive. Inhalation of cobalt containing dust has also lead to pathologic reactions in the lung parenchyma. The lesions, called ‘hard metal disease’, have ranged from intense alveolitis resembling desquamative or giant-cell interstitial pneumonitis to end-stage pulmonary fibrosis. Epidemiological and experimental data suggest that parenchymal lesions are rarely if ever induced by pure cobalt dust alone, but require the concomitant exposure to other compounds such as tungsten carbide. At the present time, there is inadequate evidence to indicate whether cobalt alone can increase the risk of lung cancer in workers. Concomitant exposure to cobalt and other substances such as in hard metal industry might increase the risk of lung cancer, but this requires confirmation.

Keywords: Cobalt, Tungsten Carbide, Interaction, Hard Metals, Lung Skin, Hard Metal, Respiratory-Diseases, Industrial-Exposure, Lung, Workers, Mortality, Question, Enigma, Oxides, Rat

Christensen, J.M. and Poulsen, O.M. (1994), A 1982-1992 surveillance program on danish pottery painters. Biological levels and health effects folloowing exposure to soluble or insoluble cobalt compounds in cobalt blue dyes. *Science of the Total Environment*, **150** (1-3), 95-104.

Full Text: [S\Sci Tot Env150, 95.pdf](S/Sci%20Tot%20Env150,%2095.pdf)

Abstract: This paper provides a short overview of cobalt-related diseases with particular reference to the potential carcinogenicity of cobalt compounds, and a review of a 10-year surveillance programme on plate painters exposed to cobalt in two Danish porcelain factories. Clinical experience and epidemiological studies have demonstrated that cobalt exposure may lead to severely impaired lung function, i.e. hard metal lung disease and occupational cobalt-related asthma, contact dermatitis and cardiovascular effects. However, the evidence for the carcinogenicity of cobalt and cobalt compounds is considered inadequate (IARC, 1991). Most frequently, exposure to cobalt occurs simultaneously with exposure to other elements known to pose a health risk, (e.g. nickel, arsenic, chromium, tungsten). The importance of cobalt as sole causal agent in hard metal long diseases, cardiomyopathy and cancer are still a matter of controversy. In the two Danish porcelain factories, cobalt blue underglaze dyes have been used since 1888. In contrast to the exposure experience of hard metal factories, the exposure of plate painters occurs with only low trace levels of other potentially harmful compounds such as the carcinogenic metals nickel, arsenic and chromium. Consequently, the nearly-pure cobalt exposure makes the plate painters an attractive group for studies on the health effects of cobalt. During the period 1982-1992 the surveillance programme showed a profound reduction in the urine level of cobalt (Co-U) from 100-fold to 1-fold above the median level of the unexposed control subjects. In the same period, the airborne cobalt exposure declined from 1356 nmol/m3 to 454 nmol/m3, the Danish occupational exposure limit being 845 nmol/m3. In 1982, when the cobalt exposure was above the occupational exposure limit, the plate painters showed a chronic impaired lung function. The obstructive effects may bc similar to some of the effects observed in hard metal workers. In 1988, a study on the effect of cobalt exposure at low levels revealed no inhibitory effects on thyroid function, but the ratio between T4 and T3 increased, indicating that low cobalt exposure may have an impact on the metabolism of thyroid hormones. Parallel studies were conducted on the metabolism and excretion of cobalt. The gastrointestinal uptake of soluble CoCl was considerably higher than the uptake of insoluble cobalt(II) oxide. In addition, it was demonstrated that ingestion of controlled amounts of the soluble cobalt compound resulted in significantly higher concentrations of cobalt in urine and blood (Co-B) from females compared with males (P < 0.01). Future studies will involve epidemiology and genotoxicity to evaluate the previous and present cancer risk, and detailed process-related exposure assessment studies to select the methods most reliable for surveillance of low-dose cobalt exposure.

Keywords: Cobalt, Pottery Plate Painters, Biological Monitoring, Health Effects, Occupational Exposure, Plate Painters, Blood

Martineau, D., de Guise, S., Fournier, M., Shugart, L., Girard, C., Lagacé, A. and Béland, P. (1994), Pathology and toxicology of beluga whales from the St. Lawrence Estuary, Quebec, Canada. Past, present and future. *Science of the Total Environment*, **154** (2-3), 201-215.

Full Text: [S\Sci Tot Env154, 201.pdf](S/Sci%20Tot%20Env154,%20201.pdf)

Abstract: An indigenous population of 450-500 beluga whales (Delphinapterus leucas) inhabiting the St. Lawrence Estuary has been exposed chronically for more than 50 years to a complex mixture of industrial pollutants including organochlorinated compounds (OC), polycyclic aromatic hydrocarbons (PAH) and heavy metals. From 1983 to 1990, we have necropsied 45 well preserved carcasses out of a total of 120 beluga whales reported dead over this period. of these 45 animals, nine were affected by 10 malignant neoplasms. Fifteen animals (33%) were affected by pneumonia. Milk production was compromised in eight of 17 mature females (41%), by inflammatory changes (seven animals) and cancer (one animal) which affected the mammary glands. Opportunistic bacteria were found in pure culture, and/or in significant amounts in at least two organs in 20 belugas (44%). The concentrations of both total PCBs and highly chlorinated PCB congeners were much higher in St. Lawrence animals than in Arctic beluga whales. OC-induced immunosuppression has been repeatedly demonstrated in a wide variety of animal species. Therefore, it is probable that the immune functions of St. Lawrence beluga whales are impaired. Benzo[a]pyrene adducts were detected in 10 of the 11 St. Lawrence beluga whales of which tissues (six livers, 10/11 brains) were analyzed by a method based on HPLC. No such adducts were found in four Arctic animals. Since benzo[alpha]pyrene is one of the most potent chemical carcinogens known to man, these compounds might be responsible for some of the cancers observed in that population. Overall, our findings contrast vividly with those of others who found that cancers are exceedingly rare in free-ranging odontocete populations and that the major causes for mortalities in these populations are bacteria, parasites, and trauma.

Keywords: Beluga, Cancer, Cetaceans, Contaminants, DDT, Immunosuppression, Organochlorine, Pathology, PCB, Polycyclic Aromatic, Hydrocarbons, Whales, Halogenated Aromatic-Hydrocarbons, Human Lymphocytes-T, Polychlorinated-Biphenyls, Delphinapterus-Leucas, Mercury Pollution, Covalent Binding, Rhesus-Monkeys, Macaca-Mulatta, Saguenay Fjord, Adrenal-Gland

Buzina, R., Stegnar, P., Buzina-Suboticanec, K., Horvat, M., Petric, I. and Farley, T.M.M. (1995), Dietary mercury intake and human exposure in an Adriatic population. *Science of the Total Environment*, **170** (3), 199-208.

Full Text: [S\Sci Tot Env170, 199.pdf](S/Sci%20Tot%20Env170,%20199.pdf)

Abstract: A study was conducted to examine human exposure to mercury through dietary mercury intake in a population living in an industrially non-polluted area of the Adriatic Sea. The results have shown that approximately 20% of the subjects had a weekly dietary mercury intake above the provisional tolerable weekly intake (PTWI), primarily those consuming fish and other seafood > 6 times/week. The estimated seafood consumption corresponding to a mean intake of PTWI of 300 micrograms total mercury was 1559 g, and 1365 g for a PTWI of 200 micrograms methylmercury. However, the total mercury content in hair in individuals consuming total mercury above the PTWI was in the range of 1.3-12.9 micrograms/g, whereas the methylmercury content in hair in subjects consuming methylmercury above the PTWI was between 1.1-10.8 micrograms. Thus, the mercury content in hair did not reach the critical level at which toxic effects of mercury could be expected. The results, particularly those related to methylmercury exposure, did not differ significantly from data reported earlier from an industrially polluted area, thus indicating that the mercury content of fish and consequent human exposure to mercury reflects primarily the general ecological characteristics of the Adriatic, rather than the impact upon a specific local pollution.

Pradhan, A.A. and Levine, A.D. (1995), Microbial biosorption of copper and lead from aqueous systems. *Science of the Total Environment*, **170** (3), 209-220.

Full Text: [S\Sci Tot Env170, 209.pdf](S/Sci%20Tot%20Env170,%20209.pdf)

Abstract: Biosorption of metal ions from aqueous systems was evaluated using a culture of acidic soil isolates grown in a completely mixed, aerobic, semi-batch culture reactor. The laboratory scale system was used to test single and bimetallic solutions of copper and lead with sulfates, chlorides, or nitrates. To elucidate the key factors influencing biosorption and to characterize metal uptake by cellular and extra cellular components of the microbial system, a dialysis testing procedure was developed. A direct contact technique was used to determine the rate of metal sorption on cellular surfaces. The effectiveness of biosorption was influenced by pH, initial metal concentrations, and anionic composition. Respirometric tests were carried out to identify potential inhibitory effects of metal accumulation on microbial oxygen uptake rates.

Keywords: Biosorption, Metallic Waste, Actinomycetes, Dialysis, Respirometry

Surbeck, H. (1995), Determination of natural radionuclides in drinking water: A tentative protocol. *Science of the Total Environment*, **173-174**, 91-99.

Full Text: [S\Sci Tot Env173-174, 91.pdf](S/Sci%20Tot%20Env173-174,%2091.pdf)

Abstract: Routine analysis of drinking water is in general limited to artificial radionuclides although some naturally occurring radionuclides have radiotoxicities well comparable to those of the worst artificial ones. This unsatisfactory situation is mainly due to problems with traditional radiochemical preparation methods. They are very time consuming and the chemistry involved is too high a hurdle for many laboratories. A simplified protocol for the determination of natural radionuclides in drinking water has been setup and tested. It makes full use of the gamma-spectrometry’s analyzing power and of state-of-the-art liquid scintillation alpha-spectrometry combined with extractive scintillators. It also includes the use of metal-adsorbing thin layers for direct alpha-spectrometry. The protocol does not offer record-low detection limits, but allows for a rapid check that no individual natural radionuclide present in the water will contribute more than 50 microS v to the annual dose.

Bricker, S.B. (1996), Retention of sediment and metals by Narragansett Bay subtidal and marsh environments: An update. *Science of the Total Environment*, **179** (1-3), 27-46.

Full Text: [S\Sci Tot Env179, 27.pdf](S/Sci%20Tot%20Env179,%2027.pdf)

Abstract: Unlike many estuaries, Narragansett Bay Rhode Island has a sufficient information base regarding sources and sinks to construct mass balances for sediment, Fe, Mn, Cr, Cu, Ni, Pb, Zn, Ag. Decadal differences in subtidal data for Pb, Cr and Cu allowed comparison of retention between the 1970s and 1980s. The role of salt marshes in mass balances is considered for the first time. Calculations suggest that Narragansett Bay retains virtually all incoming sediment, the greater portion of incoming Fe (87%), Cu (102-119%) and Pb (39%-203%) and about one third the input of Zn and Mn. The results for Cr (> 300% retention) suggest an unaccounted source, while results for Ag and Ni (17% and 12% retention) suggest a loss of these metals from the system. The salt marshes are nearly insignificant to retention with the exception of Fe for which they account for one third of total retention. For the metals Pb, Cr and Cu, comparison of the 1970s and 1980s data suggests reductions in sediment burden reflective of reductions in sewage discharge of metals and limitations on the use of Pb in a gasoline.

Liou, S.H., Wu, T.N., Chiang, H.C., Yang, G.Y., Yang, T., Wu, Y.Q., Lai, J.S., Ho, S.T., Lee, C.C., Ko, Y.C., Ko, K.N. and Chang, P.Y. (1996), Blood lead levels in Taiwanese adults: Distribution and influencing factors. *Science of the Total Environment*, **180** (3), 211-219.

Full Text: [S\Sci Tot Env180, 211.pdf](S/Sci%20Tot%20Env180,%20211.pdf)

Abstract: Five-thousand nine-hundred thirteen Taiwanese adults were selected by multistage sampling methods to investigate environmental lead exposure in Taiwan. The blood specimens were distributed to six laboratories for blood lead levels (BLL) measurement. The mean BLL of the 5913 Taiwanese adults was 8.28±5.39 microg/dl, with a maximum level of 57.6 microg/dl. The median was 7.0 microg/dl and 90th percentile was 15.0 microg/dl. BLLs were associated with gender, ethnic group, education level, smoking, alcohol consumption, herbal drug consumption, milk consumption, sources of drinking water, level of urbanization, and occupational lead exposure. These results showed that BLLs in Taiwanese adults were stable during the 2-year study. Most of the influencing factors were consistent with other studies, while local risk factors, such as Chinese herbal drug consumption are important ways of preventing the general population from overexposure to lead.

Ohe, T. (1996), Antigenotoxic activities of chitin and chitosan as assayed by sister chromatid exchange. *Science of the Total Environment*, **181** (1), 1-5.

Full Text: [S\Sci Tot Env181, 1.pdf](S/Sci%20Tot%20Env181,%201.pdf)

Abstract: The antigenotoxic activities of chitin and chitosan were studied using sister chromatid exchange assay by examining the adsorption of four kinds of mutagens. These two dietary animal fibers showed similar patterns in reducing the genotoxicity of aqueous solutions of the hydrophobic mutagens, 4-nitroquinoline-N-oxide and dinitropyrene, in distilled water. Under similar conditions, the antigenotoxic activities of chitin and chitosan for mitomycin C were 87 and 0%, and those for adriamycin were 47 and 78%, respectively. In addition, the antigenotoxic activity of both fibers for MMC was affected by the pH value of the aqueous solution between 2.5 and 7.2, but that of ADM was not. The results demonstrate that chitin and chitosan may have protective effects against environmental mutagens by adsorbing them in ionic and nonionic solutions.

Keywords: Chitin, Chitosan, Antigenotoxic Activity, Sister Chromatid Exchange Assay, Hydrophilic Mutagen, Hydrophobic Mutagen, Dietary Fiber, Hydrophobic Mutagen, Invitro Binding, Adsorption, Cancer, Water

Butler, C.A. and Timperley, M.H. (1996), Fertilised farmland as a source of cadmium in oysters. *Science of the Total Environment*, **181** (1), 31-44.

Full Text: [S\Sci Tot Env181, 31.pdf](S/Sci%20Tot%20Env181,%2031.pdf)

Abstract: Cadmium, added as a contaminant in phosphatic fertilisers to pasture soils of the Mahurangi catchment is mobile through both leaching from the acidic soils and erosion. The high cadmium concentrations on the smallest particles in both soils and freshwater sediments enhances particulate cadmium transport by erosion and fluvial action into the downstream estuary. In the saline conditions of the estuary, cadmium is desorbed from the suspended particles and bed sediments in the lower part of the estuary have low cadmium concentrations. The lowest cadmium concentrations in oysters are found in the riverine section of the estuary where cadmium uptake appears to occur by ingestion of the particulate matter carried into the estuary by the inflowing tributaries. In the lower, permanently saline part of the estuary, where oyster cadmium concentrations are the highest, phytoplankton appear to accumulate dissolved cadmium. The high concentrations of cadmium in oysters result from the selective ingestion of these cadmium-rich phytoplankton.

Keywords: Cadmium, Fertiliser, Farmland, Estuary, Oyster, Crassostrea-Gigas, Adsorption, Soils, Superphosphate, Accumulation, Copper, Plants, Water, Cd, Pb

Bu-Olayan, A.H., Al-Yakoob, S.N. and Alhazeem, S. (1996), Lead in drinking water from water coolers and in fingernails from subjects in Kuwait City, Kuwait. *Science of the Total Environment*, **181** (3), 209-214.

Full Text: [S\Sci Tot Env181, 209.pdf](S/Sci%20Tot%20Env181,%20209.pdf)

Abstract: In response to concerns raised by the Kuwait Ministry of Public Health (KMPH) about the high lead levels in some commercial water coolers, samples of drinking water and fingernails were collected from 129 healthy donors (77 males and 52 females) during the period December 1994-February 1995. The mean nail lead levels for females and males were 5.50±7.76 and 5.08±14.65 microg/g, respectively, and the difference between these means was not significant (P = 0.025). A positive correlation was found between lead levels in drinking water and lead in fingernails from both males and females. However, the effect of water lead levels on lead levels in fingernails of females was more significant (P = 0.002) than that on levels in fingernails of males (P = 0.21). Contrasted with all other coolers, water from one brand of coolers, Al-Hassawi, appears to contribute significantly to lead exposures among households with lead levels ranging between 15.89 and 70.30 microg/l and mean of 32.09±13.23 microg/l.

Al-Saleh, I.A. (1996), Trace elements in drinking water coolers collected from primary schools, Riyadh, Saudi Arabia. *Science of the Total Environment*, **181** (3), 215-221.

Full Text: [S\Sci Tot Env181, 215.pdf](S/Sci%20Tot%20Env181,%20215.pdf)

Abstract: A simple method for the spectrochemical analysis of water samples by inductively coupled plasma spectrometry is described. Samples from drinking water coolers in 32 schools in Riyadh were collected at a specific time during a typical school day and analyzed for aluminum (Al), beryllium (Be), cadmium (Cd), cobalt (Go), chromium (Cr), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), nickel (Ni), silicon (Si), strontium (Sr), vanadium (V), and zinc (Zn) to ascertain the water quality. The analysis of drinking water showed high concentrations of metals and in some cases exceeded the guideline limits recommended by EEC and WHO.

Keywords: Drinking Water, Analysis, Drinking Water Coolers, Riyadh, Indian Childhood Cirrhosis, Aluminum, Disease, Implantation, Association, Metabolism, Toxicity, Vanadium, Cancer, Norway

Weihe, P., Grandjean, P., Debes, F. and White, R. (1996), Health implications for Faroe islanders of heavy metals and PCBs from pilot whales. *Science of the Total Environment*, **186** (1-2), 141-148.

Full Text: [S\Sci Tot Env186, 141.pdf](S/Sci%20Tot%20Env186,%20141.pdf)

Abstract: In the Faroe Islands marine food constitutes a considerable part of the diet. In addition to fish, both meat and blubber from pilot whales are included in the diet. Muscle tissue of pilot whales caught in the Faroe Islands contains an average mercury concentration of 3.3 micrograms/g (16 nmol/g), about half of which is methylmercury. In some years an evenly distributed annual catch of pilot whales would make the average dietary intake of mercury close to an excess of the Provisional Temporary Weekly Intake of 0.3 mg recommended by WHO. In one out of eight consecutive births, the mercury concentration in maternal hair exceeded a limit of 10 micrograms/g where a risk of neurobehavioral dysfunction in the child may occur, the maximum was 39.1 micrograms/g. Mercury concentrations in umbilical cord blood showed a similar distribution with a maximum of 351 micrograms/l. The large variation in mercury exposure is associated with differences in the frequency of whale dinners. The average PCB concentration in pilot whale blubber is very high, i.e. about 30 micrograms/g. With an estimated daily consumption of 7 g of blubber, the average daily PCB intake could therefore exceed 200 micrograms, i.e. close to the Acceptable Daily Intake. In Scandinavia, the average daily PCB intake is about 15-20 micrograms. To obtain an improved scientific basis for public health action, two major prospective studies have been initiated. A birth cohort of 1000 children has been examined at approximately 7 years of age for neurobehavioral dysfunctions associated with prenatal exposure to mercury and PCB. Preliminary analyses of the data show that several neurobehavioral tests are associated with mercury exposure parameters. With emphasis on prenatal exposures to PCB, another cohort has been generated during 1994-95, and this cohort will be followed closely during the next years.

Zevenbergen, C., van Reeuwijk, L.P., Frapporti, G., Louws, R.J. and Schuiling, R.D. (1996), A simple method for defluoridation of drinking water at village level by adsorption on Ando soil in Kenya. *Science of the Total Environment*, **188** (2-3), 225-232.

Full Text: [S\Sci Tot Env188, 225.pdf](S/Sci%20Tot%20Env188,%20225.pdf)

Abstract: In this paper a new and simple defluoridation method is presented using local Kenyan soil derived from volcanic ash (e.g. Ando soils or soils with ‘andic’ properties) as a fluoride sorbent. The ability of Kenyan Ando soil to adsorb fluoride was determined experimentally. These results were extended to possible technical application using a one dimensional solute transport model. Based on the results it is concluded that the use of Ando soils appears to be an economical and efficient method for defluoridation of drinking water on a small scale in rural areas of Kenya and other regions along the Rift Zone. Further research is warranted to evaluate its practical applications and social acceptance.

Keywords: Defluoridation Method, Fluoride Adsorption, Ando Soil, Fluorosis

? Chlopecka, A. (1996), Assessment of form of Cd, Zn and Pb in contaminated calcareous and gleyed soils in southwest Poland. *Science of the Total Environment*, **188** (2-3), 253-262.

Full Text: [1996\Sci Tot Env188, 253.pdf](1996/Sci%20Tot%20Env188,%20253.pdf)

Abstract: A knowledge of the total amount of trace metals in soils is generally not sufficient to assess environmental impacts of metal contamination. Quantification of different metal forms enables evaluation of their behavior and of their eventual bioavailability in the soil environment. Calcareous and gleyed soils contaminated by Cd, Pb and Zn found in the heavily industrialized area of Tarnowskie Gory (Upper Silesia, Poland) were examined by sequential extraction analysis to assess the forms of these metals in a range extending from background levels to concentrations well in excess of those prescribed as the maximum tolerable limits for Polish soils. Cadmium ranged from 0.41 to 25.5, Pb from 12.7 to 1730 and Zn from 13.9 to 2800 mu g g(-1) soil, respectively. In general, the metals were associated with more mobile forms in the contaminated soils and particularly in the gleyed soils which tended to be acidic is nature.

Keywords: Calcareous, Gleysols, Rendzina, Hydromorphic, Sequential Extraction, Heavy Metals, Upper Silesia, Cadmium, Lead, Zinc, Copper, pH

Pimentel, D. (1996), Green revolution agriculture and chemical hazards. *Science of the Total Environment*, **188**, S86-S98.

Full Text: [S\Sci Tot Env188, S86.pdf](S/Sci%20Tot%20Env188,%20S86.pdf)

Sheail, J. (1997), The institutional development of river management in Yorkshire. *Science of the Total Environment*, **194-195**, 225-234.

Full Text: [S\Sci Tot Env184-195, 225.pdf](S/Sci%20Tot%20Env184-195,%20225.pdf)

Abstract: The paper draws on the archives of the relevant river-management bodies of Yorkshire, in Northern England, in illustrating how the preoccupations, aspirations and knowledge of policy makers and their respective engineers affected the pace and direction of watercourse and catchment management during the last 150 years.

Edwards, A.M.C., Freestone, R.J. and Crockett, C.P. (1997), River management in the Humber catchment. *Science of the Total Environment*, **194-195**, 235-246.

Full Text: [S\Sci Tot Env184-195, 235.pdf](S/Sci%20Tot%20Env184-195,%20235.pdf)

Abstract: The Humber Estuary receives runoff from a fifth of the area of England, much of which is densely populated and industrialised. The river systems have been much altered by abstractions, effluent discharges, inter-river water transfers and changes to the physical habitat of channels. The riverine inputs of water, sediment and contaminants have a major influence on the environment of the Humber and the North Sea. Residual flow conditions are important for protecting uses of the rivers and the estuary. Some of the rivers have had a long history of pollution, although much investment in effluent treatment is in progress to improve water quality and ecology and to achieve environmental quality standards for dangerous substances specified in international legislation. The aim is for a more sustainable management of the river systems, balancing the interests of their legitimate users.

? Chlopecka, A. (1997), Assessment of form of Cd, Zn and Pb in contaminated calcareous and gleyed soils in Southwest Poland (vol 188, pg 253, 1996). *Science of the Total Environment*, **196** (3), 263.

Full Text: [1997\Sci Tot Env196, 263.pdf](1997/Sci%20Tot%20Env196,%20263.pdf)

Sheets, R.W. (1997), Extraction of lead, cadmium and zinc from overglaze decorations on ceramic dinnerware by acidic and basic food substances. *Science of the Total Environment*, **197** (1-3), 167-175.

Full Text: [S\Sci Tot Env197, 167.pdf](S/Sci%20Tot%20Env197,%20167.pdf)

Abstract: Dinnerware decorated with overglaze designs can release toxic metals into food substances in amounts high enough to constitute health hazards. When dishes made in the US before 1970 were filled with 4% acetic acid for 24 h, lead concentrations of up to 610 μg/ml and cadmium concentrations of up to 15 μg/ml were measured. Acetic acid leachates from more than half the dishes tested for lead (78 of 149) contained levels exceeding the US Food and Drug Administration (FDA) allowable concentration of 3.0 μg/ml. One-fourth of dishes tested for cadmium (26 of 98) exceeded the FDA limit of 0.5 μg/ml. High concentrations of lead, cadmium and zinc were also released into 1% solutions of citric and lactic acids. Significant amounts of these metals were extracted by basic solutions of sodium citrate and sodium tripolyphosphate, as well as by commercial food substances including sauerkraut juice, pickle juice, orange juice, and low-lactose milk. Relative concentrations of lead, zinc and cadmium released depend on the leaching agent used. Citric acid leachates contain higher lead: cadmium and zinc: cadmium (but lower lead: zinc) ratios than do acetic acid leachates from nominally identical dishes. Repeated extractions with acetic acid show that even after 20 consecutive 24-h leachings many dishes still release lead in concentrations exceeding FDA limits.

Keywords: Cadmium, Glazed Ceramic Dinnerware, Lead, Toxic Metals, Zinc

Jung, M.C. and Thornton, I. (1997), Environmental contamination and seasonal variation of metals in soils, plants and waters in the paddy fields around a Pb-Zn mine in Korea. *Science of the Total Environment*, **198** (2), 105-121.

Full Text: [S\Sci Tot Env198, 105.pdf](S/Sci%20Tot%20Env198,%20105.pdf)

Abstract: The objective of this study is to investigate the extent and degree of heavy metal contamination of paddy fields influenced by metalliferous mining activity. Paddy soils, rice plants and irrigation waters were sampled along six traverse lines in the vicinity of the mine and nearby control site. Soil samples were taken 30, 80 and 150 days after rice transplanting, to study seasonal variation of their chemical properties and heavy metal concentrations. Sampling of rice plants and irrigation waters was also undertaken with seasons. The analysis of the samples were carried out using ICP-AES for 25 elements including Cd, Cu, Pb and Zn. Physical and chemical properties of soils (pH, loss-on-ignition, cation exchange capacity and texture) and waters (pH, Eh and temperature) were also measured. The properties of soils were similar to the average Korean soils, with the exception of some samples taken in the vicinity of the mine. Concentrations of Cd, Cu, Pb and Zn in paddy soils, rice plants and irrigation waters sampled in the immediate vicinity of the mine were relatively high due to the seepage of metals from mining dump sites. Although there was variation between sampling sites, soil pH values under reducing conditions were on average higher than those under oxidising conditions. Relatively low content of organic matter and low cation exchange capacity of soils were found at 80 days after rice transplanting (P < 0.05). No seasonal variations in metal concentrations were found in paddy soils throughout the period of the rice growing, in which soils ranged from flooded reducing conditions through most of the growing season to drained oxidising conditions before and at harvest. Relatively high metal concentrations were found in the rice stalks and leaves under oxidising conditions. The sequential extraction analysis of selected soil samples confirmed that high proportions of exchangeable fractions of the metals were found under oxidising conditions. It was shown that Cd and Zn concentrations in rice leaves and stalks and rice grain increased with increasing metal concentrations in paddy soils to a greater extent than for Cu and Pb. This difference in uptake is in agreement with the greater proportions of Cd and Zn, compared with Cu and Pb, in the exchangeable soil fraction extracted with MgCl2. Average daily intake from locally grown rice by the residents was estimated to be 121 micrograms Cd and 126 micrograms Pb. Thus, long-term metal exposure by regular consumption of the rice poses potential health problems to residents in the vicinity of the mine, although no adverse health effects have as yet been observed.

Soto, M., Ireland, M.P. and Marigómez, I. (1997), The contribution of metal/shell-weight index in target-tissues to metal body burden in sentinel marine mollusks. 1. *Littorina littorea*. *Science of the Total Environment*, **198** (2), 135-147.

Full Text: [S\Sci Tot Env198, 135.pdf](S/Sci%20Tot%20Env198,%20135.pdf)

Abstract: Accumulation and tissue distribution of Cu and Zn in target organs of Littorina littorea have been investigated. Weight changes in particular organs were associated with either Cu or Zn exposures and therefore, metal/shell-weight indices were used instead of metal concentrations to investigate metal accumulation and mobilisation. A regulatory mechanism was observed on exposure to low levels of Cu, but regulation did not occur between 8 and 80 µg Cu/l seawater. Conversely, Zn was well-regulated up to a concentration of 80 µg Zn/l seawater. Zn/Cu index increased linearly at increasing Zn exposure levels and decreased linearly at increasing Cu exposure levels. The gills are not target tissues reflecting environmental levels of either Cu or Zn, however, copper levels were elevated in gills after exposure to 80 µg Cu/l seawater for 29 and 41 days. On the other hand, the highest concentration of Cu in the kidney was found after exposure to 8 µg Cu/l seawater for 41 days. Higher exposures resulted in lower Cu concentrations. According to metal/shell-weight indices, Cu and Zn were not significantly accumulated in the digestive gland/gonad complex (DGGC) until a certain threshold value was reached (exposure level >400 µg . day/1). On the other hand, DGGC weight was significantly reduced and, concomitantly, Zn and Cu concentrations raised. However, the metal concentration values increased beyond those resulting simply from a weight reduction. In conclusion, dissimilar mechanisms performed by different cell types in the different organs, together with metal-induced weight changes, would account for the existence of different patterns of metal accumulation and tissue distribution. It is therefore suggested that the suitability of winkles as indicators of Cu and Zn pollution should be reconsidered on the basis of measurements of metal burdens at tissue and cell levels. (C) 1997 Elsevier Science B.V.

Keywords: Metals, Accumulation, Tissue Distribution, AAS, Mobilization, Excretion, Mussel Mytilus-Edulis, Heavy-Metals, Sublethal Concentrations, Crassostrea-Virginica, Digestive Gland, Cancer-Pagurus, Polluted Sites, Shell-Weight, Food-Chain, Cadmium

Schuhmacher, M., Domingo, J.L., Llobet, J.M., Müller, L. and Jager, J. (1997), Levels of PCDDs and PCDFs in grasses and weeds collected near a municipal solid waste incinerator. *Science of the Total Environment*, **201** (1), 53-62.

Full Text: [S\Sci Tot Env201, 53.pdf](S/Sci%20Tot%20Env201,%2053.pdf)

Lu, X.Q. and Johnson, W.D. (1997), The reaction of aquatic humic substances with copper(II) ions: An SER study of complexation. *Science of the Total Environment*, **203** (3), 199-207.

Full Text: [S\Sci Tot Env203, 199.pdf](S/Sci%20Tot%20Env203,%20199.pdf)

Abstract: The reaction of copper(II) ions with humic substances (HS) isolated from swamp water has been studied by electron spin resonance (ESR) spectroscopy at different HS: Cu molar ratios over the pH range from 3 to 13. Three distinct HS-Cu complexes have been detected at different HS: Cu molar ratios. At a HS: Cu molar ratio of 0.003, a complex with a *g*z.pSlash, value of 2.40 forms. This can be attributed to a complex [Cu(H2O)5]L, with one oxygen donor ligand. This complex is very sensitive to pH and a precipitate is formed at pH 7, suggesting that the complex is a mixed HS-Cu-H2O complex. Increasing the HS: Cu molar ratio to 0.03 leads to the formation of a complex with a *g*z.pSlash, value of 2.35 [Cu(H2O)4]L2. At a HS: Cu molar ratio of 0.6, a complex with a g&z.pSlash, value of 2.31 [Cu(H2O)2]L4 forms. This HS-Cu complex is pH resistant up to pH 10 and an inner sphere bond complex must have formed. The stability constants of HS-Cu complexes formed at different molar ratios were estimated from the corresponding ESR parameter *g*&z.pSlash, values. The ESR results are consistent with calculated species distributions of copper ions under similar conditions. This calculation shows that at a lower concentration of humic substances, the percentage of the complex formed decreases with an increase of pH and this complex does not exist at pH above 7, while at a higher concentration of humic substances, HS-Cu complexes with high stability are dominant in solution up to pH 10.

Keywords: Copper(II) ions, Humic Substances, ESR spectroscopy

Vedrina-Dragojević, I. and Dragojević, D. (1997), Trichloroethene and tetrachloroethene in ground waters of Zagreb, Croatia. *Science of the Total Environment*, **203** (3), 253-259.

Full Text: [S\Sci Tot Env203, 253.pdf](S/Sci%20Tot%20Env203,%20253.pdf)

Abstract: At the end of 1986 the presence of chlorinated hydrocarbons was detected in the ground water of the industrial area of Zagreb, Croatia. Concentrations of trichloroethene and tetrachloroethene were close to or exceeded maximum admissible concentrations prescribed by the Public Health Regulations for drinking water (30 µg/l for trichloroethene and 10 µg/l for tetrachloroethene). The pumping-site situated within the area had been temporarily closed until a water-treatment plant based upon adsorption on activated carbon was built. Analysis of the results of adsorption of the investigated chlorinated hydrocarbons on activated carbon in granules confirmed a remarkably better adsorption of tetrachloroethene compared to trichloroethene. By constant monitoring and replacing of saturated carbon at the appropriate time, the concentrations of trichloroethene and tetrachloroethene in drinking water consumed by approx. 20% of the city population never exceeded maximum admissible concentrations in the course of 10 years. (C) 1997 Elsevier Science B.V.

Keywords: Activated Carbon-Fibers, Drinking-Water, Adsorption, Toxicity, Quality, Trichloroethene, Tetrachloroethene, Ground Water, Drinking Water, Liquid-Liquid Extraction Gas Chromatographic Method

Zacheus, O.M. and Martikainen, P.J. (1997), Physicochemical quality of drinking and hot waters in Finnish buildings originated from groundwater or surface water plants. *Science of the Total Environment*, **204** (1), 1-10.

Full Text: [S\Sci Tot Env204, 1.pdf](S/Sci%20Tot%20Env204,%201.pdf)

Abstract: The physicochemical quality of drinking and hot waters of 67 buildings in different parts of Finland was studied. Some of the buildings used processed groundwater and some processed surface water. Drinking water samples were taken from the first tap after the water was led into the building. Hot water samples were taken from taps and showers and from circulating hot water systems. Thy physicochemical quality of drinking water was affected by the origin of raw water used in the water plants. Drinking water from surface water plants contained more organic matter and less metals than water from groundwater plants. The quality goal for total organic carbon (TOC, < 2 mg l-1) was exceeded by all drinking water samples. In groundwaters, the variation in the content of non-purgeable organic carbon (NPOC) was great, probably because artificial groundwaters processed from surface waters were included in this group. Unlike in natural waters, the correlation between KMnO4-number and NPOC in the processed waters was weak. This result shows that KMnO4-number is an inaccurate estimate for organic carbon in processed waters. Corrosion of pipe materials was seen as elevated concentrations of iron and copper. In general, the physicochemical quality of drinking and hot waters in the buildings was rather similar.

Martín-Lagos, F., Navarro-Alarcón, M., Terrés-Martos, C., de la Serrana, H.L.G. and López-Martínez, M.C. (1997), Serum copper and zinc concentrations in serum from patients with cancer and cardiovascular disease. *Science of the Total Environment*, **204** (1), 27-35.

Full Text: [S\Sci Tot Env204, 27.pdf](S/Sci%20Tot%20Env204,%2027.pdf)

Abstract: A single cross-Keywords: Trace-Elements, Plasma Copper, Breast-Cancer, Ratio, Deficiency, Ceruloplasmin, Nutrient, Cardiopathy, Cancer, Copper, Zinc, Serum sectional study for serum copper and zinc levelswas evaluated in 20 patients with cancer (respiratory, digestive, haematological, gynaecological) and 21 patients withcardiopathy (acute myocardial infarction and ischemic cardiomyopathy). A control group of 84 healthy subjects was selected. The mean serum zinc levels in patients with gynaecological cancer and ischemic cardiomyopathy were significantly lower than the control group (P < 0.05). However, the mean serum copper level was not statistically different among patients with cancer (P > 0.05) and cardiomyopathy (P > 0.05) than the control group. Male patients did not have statistically different values for serum Cu (P > 0.05) and Zn (P > 0.05) than those found in female patients. Patients’ age did not have any statistical influence (P > 0.05) on serum Cu and Zn levels. (C) 1997 Elsevier Science B.V.

Keywords: Cardiopathy, Cancer, Copper, Zinc, Serum, Trace-Elements, Plasma Copper, Breast-Cancer, Ratio, Deficiency, Ceruloplasmin, Nutrient

Neumann, C.M., Kauffman, K.W. and Gilroy, D.J. (1997), Methylmercury in fish from Owyhee Reservoir in southeast Oregon: Scientific uncertainty and fish advisories. *Science of the Total Environment*, **204** (3), 205-214.

Full Text: [S\Sci Tot Env204, 205.pdf](S/Sci%20Tot%20Env204,%20205.pdf)

Abstract: Data collected during 1987-1994 showed elevated levels of mercury (Hg) in fish tissue from the Owyhee Reservoir in southeastern Oregon. Sixty-five percent of the samples analyzed had total Hg levels exceeding the US Environmental Protection Agency’s (EPA) health screening value of 0.6 mg/kg. Eighteen out of 89 (20%) fish tissue samples also had total Hg levels greater than the US Food and Drug Administration’s (FDA) mercury action level of 1.0 mg/kg. The overall mean Hg content for all fish collected from the reservoir was 0.75 mg/kg wet weight (wet wt.). Fish muscle taken from largemouth bass (Micropterus salmoides), smallmouth bass (Micropterus dolomieu) and channel catfish (Ictalurus punctatus) had the highest mean Hg levels of 0.92, 0.87 and 0.82 mg/kg, respectively. In contrast, rainbow trout (Salmo gairdneri) had the lowest mean Hg content of 0.37 mg/kg. Increases in total Hg concentrations were found to be positively correlated with size for rainbow trout and yellow perch. A weak but significant correlation was also observed between total mercury content and age for smallmouth bass. Based on these data, in 1994 the Oregon Health Division (OHD) issued a fish consumption advisory for the Owyhee Reservoir using a conservative risk-based approach. The process of defining and communicating these consumption limits is the subject of this paper.

? Leggett, R.W. (1997), A model of the distribution and retention of tungsten in the human body. *Science of the Total Environment*, **206** (2-3), 147-165.

Full Text: [1997\Sci Tot Env206, 147.pdf](1997/Sci%20Tot%20Env206,%20147.pdf)

Abstract: Expanding industrial and military uses of tungsten could result in substantially increased levels of this metal in the environment in the next few years. Although occupational experiences and available toxicological studies on laboratory animals suggest that tungsten may have a relatively low order of toxicity, the data are weak and inconclusive. There is a need not only for more systematic studies of the behavior and effects of tungsten in different animal species but also for a reliable, biologically realistic biokinetic model for tungsten in man that can be used to relate concentrations of this metal in environmental media to concentrations in tissues of exposed persons and translate results of experimental studies into term of environmental exposures. This paper is intended as a first step toward development of such a biokinetic model. Information related to the biokinetics of tungsten in mammalian species is examined, a biologically meaningful compartmental model structure is proposed, provisional transfer rates between compartments are selected, areas are identified where additional biokinetic data on tungsten are most needed and suggestions are made for further research into the biokinetics of tungsten. (C) 1997 Elsevier Science B.V.

Keywords: Tungsten, Biokinetics, Model, Man, Distribution, Retention, Excretion, Metal Lung-Disease, Biological Function, Molecular-Basis, Calcium Tungstate, Xanthine-Oxidase, Biokinetic Model, Sulfite Oxidase, Treated Rats, Molybdenum, Elements

Asubiojo, O.I., Nkono, N.A., Ogunsua, A.O., Oluwole, A.F., Ward, N.I., Akanle, O.A. and Spyrou, N.M. (1997), Trace elements in drinking and groundwater samples in Southern Nigeria. *Science of the Total Environment*, **208** (1-2), 1-8.

Full Text: [S\Sci Tot Env208, 1.pdf](S/Sci%20Tot%20Env208,%201.pdf)

Abstract: The levels of Al, Sn, Cs, Rb, Sr, Br, Cr, Mo, Co, Ba, Cu, Zn, Cd, Pb, Mn, Se, As, V and Ni were determined in drinking water supplies (public taps, domestic taps and treated water from public water sources) and groundwater supplies (boreholes and shallow wells) in some parts of Southern Nigeria. The water samples were analysed using inductively coupled plasma mass-spectrometry (ICP-MS). The mean levels (µg/l) of all the elements ranged between 0.35 µg/l for Cs and 87.3 µg/l for Zn in the drinking waters and between 0.54 µg/l for Co and 420.3 µg/l for Ba in the groundwaters. A comparison of the elemental concentrations with WHO guidelines showed that with the exception of violations of Cd, Cr and Se limits in some of the drinking water samples, the levels of all the other elements investigated were below the WHO maximum allowable concentrations. (C) 1997 Elsevier Science B.V.

Keywords: Trace Elements, Drinking Water, Groundwater, WHO Regulations, Human Exposure, Aluminum, Water, Lead, Norway

Kuo, H.W., Chiang, T.F., Lo, L.I., Lai, J.S., Chan, C.C. and Wang, J.D. (1997), VOC concentration in Taiwan’s household drinking water. *Science of the Total Environment*, **208** (1-2), 41-47.

Full Text: [S\Sci Tot Env208, 41.pdf](S/Sci%20Tot%20Env208,%2041.pdf)

Abstract: The objective of this study is to analyze volatile organic compound (VOC) concentrations in Taiwan’s drinking water supply. Focusing on Taiwan’s three major metropolitan areas-Taipei, Taichung and Kaohsiung (in the north, middle and south, respectively)-171 samples were taken from tap water and 68 from boiled water. Tests showed VOC concentrations were highest in Kaohsiung. This is due to different water sources and methods of treatment. Except for bromoform, trihalomethane (THM) concentrations were highest. Detection rates of toluene and 1,2-dichloroethane were slightly higher than other VOC compounds. VOC concentrations decreased significantly after water was boiled. THMs had a removal rate from 61% to 82%. The authors conclude that the three metropolitan areas contain significantly different levels of VOCs and that boiling can significantly reduce the presence of VOCs. Other sources of pollution that contaminate drinking water such as industrial plants and gas stations must be further investigated. (C) 1997 Elsevier Science B.V.

Keywords: VOC Concentration, Household Drinking Water, Trihalomethanes, Cancer

Nkono, N.A. and Asubiojo, O.I. (1997), Trace elements in bottled and soft drinks in Nigeria: A preliminary study. *Science of the Total Environment*, **208** (3), 161-163.

Full Text: [S\Sci Tot Env208, 161.pdf](S/Sci%20Tot%20Env208,%20161.pdf)

Abstract: The levels of Co, Cu, Zn, Cd, Pb, Cr, Se and Ni were determined in bottled waters and soft drinks in Nigeria. The mean levels of the elements ranged between 0.52 µg/l for Co and 14.8 µg/l for Mn in the bottled waters and 3.10 µg/l for Co and 82.4 µg/l for Mn in the soft drinks, respectively. Comparison of the elemental concentrations in the water samples with WHO limits showed the mean levels of all the elements investigated in all the samples were below the WHO maximum allowable concentrations for drinking waters. (C) 1997 Elsevier Science B.V.

Keywords: Trace Elements, Bottled Water, Soft Drinks, Who Limits, Nigeria

Collett, R.S., Oduyemi, K. and Lill, D.E. (1998), An investigation of environmental levels of cadmium and lead in airborne matter and surface soils within the locality of a municipal waste incinerator. *Science of the Total Environment*, **209** (2-3), 157-167.

Full Text: [S\Sci Tot Env209, 157.pdf](S/Sci%20Tot%20Env209,%20157.pdf)

Abstract: The results of an investigation into the environmental. impact of heavy metals in the airborne emissions from the Baldovie municipal waste incinerator, Scotland, are presented. A sampling network of l-km grid squares covering a 7x9 km area was established over the incinerator plant and its surroundings. Surface soil core samples were collected from within each 1 km2 and analysed for cadmium and lead content. The spatial distribution of lead levels in soils showed a marked variation downwind from the Baldovie incinerator in comparison with the background level for the area but remained well within the typical range of lead in rural, unpolluted, British soils. A comparison of the observed levels of lead in local soils, with the predicted downwind long-term ground level lead distribution in air indicates that atmospheric emissions of lead originating from the Baldovie incinerator directly determine concentrations of lead in soils within a radius of 5 km of the incinerator. An empirical relationship between the levels of lead in soils and the long-term levels in air was established. In the case of cadmium, the spatial distribution of the heavy metal showed neither a marked nor extensive contamination of the sampled area around the incinerator and remained within the typical range of cadmium levels in rural, unpolluted, British soils. The work concludes that atmospheric emissions of lead from the Baldovie incinerator significantly determines the local distribution of lead in soils within the immediate vicinity of the incinerator. (C) 1998 Elsevier Science B.V.

Keywords: Municipal Waste Incinerators, Cadmium, Lead, Heavy Metals In Soils, Atmospheric Emissions, Atmospheric Transport, Long-Term, Deposition, Inventory

Levallois, P., Guévin, N., Gingras, S., Lévesque, B., Weber, J.P and Letarte, R. (1998), New patterns of drinking-water consumption: Results of a pilot study. *Science of the Total Environment*, **209** (2-3), 233-241.

Full Text: [S\Sci Tot Env209, 233.pdf](S/Sci%20Tot%20Env209,%20233.pdf)

Abstract: A pilot study on water consumption was carried out in the Quebec City region in April and May 1996 with 125 people using a 24-h recall plus a 2-day diary. Consumption of drinking water via liquid and food was assessed as well as the type of water consumed (tap, bottle or filtered water) and place of consumption (home or away from home). Most of the people (56%) were drinking some bottled water or filtered tap water and 25% of water intake was away from home. Food consumption was found to be a non-significant source of drinking-water intake. The average water consumption was nearly similar in exclusively tap-water consumers and bottled-or filtered-water consumers (1.5 vs. 1.71/day, P = 0.29) but two-thirds of the consumption in this last group is natural water, while it is mixed water in the bottled/filtered-water group. No significant difference in amounts consumed were found according to age, but older people drank hot beverages and soup more often. The present pilot-study was weakened by a low participation rate (14%). Incentive might be necessary to improve participation rate and data collection methods must also be simplified. A 24-h recall plus a 1-day diary seem sufficient and data on consumption could be limited to liquids, soups and cereals. (C) 1998 Elsevier Science B.V.

Keywords: Drinking Water, Consumption, Population Survey, Exposure

Chua, H. (1998), Bio-accumulation of environmental residues of rare earth elements in aquatic flora Eichhornia crassipes (Mart.) Solms in Guangdong Province of China. *Science of the Total Environment*, **214** (1-3), 79-85.

Full Text: [S\Sci Tot Env214, 79.pdf](S/Sci%20Tot%20Env214,%2079.pdf)

Abstract: Scattering and bio-accumulation of rare earth elements (REEs), including the inner transition series, in the aquatic environment in southern China have resulted from increased industrial and agricultural applications. Environmental residues of REEs entered into aquatic flora, namely Eichhornia crassipes, commonly known as water hyacinth, via the root system in contaminated substrate water and could distribute to various parts of the plant. REEs could also bio-accumulate and concentrate in the leaves at a concentration ratio of approx. 3 times regardless of initial REE concentration in the substrate water. REEs could also enter into the plant via the leaves that are exposed to atmospheric contaminants. While officially permitted residual concentrations of mixed REE nitrates in foodstuffs or animal feedstocks are not available, high REE concentrations in the substrate water in which water hyacinth grew could possibly enter the human food chain and lead to adverse public health problems. (C) 1998 Elsevier Science B.V.

Chua, H. (1998), Effects of trace chromium on organic adsorption capacity and organic removal in activated sludge. *Science of the Total Environment*, **214** (1-3), 239-245.

Full Text: [S\Sci Tot Env214, 239.pdf](S/Sci%20Tot%20Env214,%20239.pdf)

Abstract: Heavy metals are commonly found in municipal sewage that contains industrial effluents. Metal concentrations above toxic levels inhibit biological processes in municipal sewage treatment works and discharge of metals into surface waters can have severe effects on the environment and public health. However, trace metals at sub-toxic concentrations have also been observed to affect COD removal in activated sludge. In this study, the effects of a trace metal (chromium) on activated sludge in a sequencing batch reactor (SBR) were investigated. Chromium-laden wastewater at a sub-toxic level of 0.05 mg/l affected the SBR performance to different extents depending on the hydraulic retention time (HRT). Organic removal in activated sludge was postulated to proceed by a rapid adsorption of organics on the sludge, followed by a slower metabolic assimilation mechanism. Heavy metal acted as a strong competitor for active sites on the sludge, hampering organic adsorption and affected the COD reduction efficiency under short HRTs of 2.5 days and below.

Keywords: Activated Sludge, Chromium, COD Adsorption Capacity, COD Removal, Trace Metal

Miettinen, I.T., Martikainen, P.J. and Vartiainen, T. (1998), Mutagenicity and amount of chloroform after chlorination of bank filtered lake water. *Science of the Total Environment*, **215** (1-2), 9-17.

Full Text: [S\Sci Tot Env215, 9.pdf](S/Sci%20Tot%20Env215,%209.pdf)

Abstract: Chlorinated drinking waters produced from humus-rich waters often have a high content of halogenated organic by-products which increases the mutagenicity of drinking water. With in vitro chlorination experiments we studied the formation of chloroform (CHCl3) and mutagenicity of artificially recharged ground water samples. The water samples where obtained from an artificial ground water plant which infiltrates humus-rich lake water through an esker island. The chlorination experiments showed that bank filtration reduced strongly the formation of chloroform and mutagenicity of chlorinated water. Reduction in the amount of chloroform and mutagenicity in chlorinated waters was strongly associated with the decrease in the total content of organic carbon and with the decrease in molecular weight of organic matter during bank filtration.

Al-Saleh, I. and Al-Doush, I. (1998), Survey of trace elements in household and bottled drinking water samples collected in Riyadh, Saudi Arabia. *Science of the Total Environment*, **216** (3), 181-192.

Full Text: [S\Sci Tot Env216, 181.pdf](S/Sci%20Tot%20Env216,%20181.pdf)

Abstract: Total dissolved beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), magnesium (Mg), manganese (Mn), mercury (Hg), nickel (Ni), selenium (Se), strontium (Sr), vanadium (V) and zinc (Zn) were measured in the drinking water of 101 households and 21 samples of retail bottled waters purchased in Riyadh, Saudi Arabia to ascertain the water quality for human consumption. The Inductively Coupled Plasma Spectrometer (ICP) was used for analysis. First-draw Fe, Mn, Ni and Zn concentrations decreased significantly after 10 min of flushing in the morning. Cd, Fe, Hg, Ni and Zn in some cases exceeded the guideline limits recommended by the EEC and WHO. (C) 1998 Elsevier Science B.V.

Keywords: Drinking Water, Bottled Water, Water Quality, Saudi Arabia, Ischemic-Heart-Disease, Sudden-Death, Myocardial-Infarction, Heavy-Metals, Magnesium, Vanadium, Iron, Carcinogenicity, Association, Metabolism

Levallois, P., Thériault, M., Rouffignat, J., Tessier, S., Landry, R., Ayotte, P., Girard, M., Gingras, S., Gauvin, D. and Chiasson, C. (1998), Groundwater contamination by nitrates associated with intensive potato culture in Québec. *Science of the Total Environment*, **217** (1-2), 91-101.

Full Text: [S\Sci Tot Env217, 91.pdf](S/Sci%20Tot%20Env217,%2091.pdf)

Abstract: In rural areas, groundwater contamination by nitrates is a problem related to the spreading of organic and chemical fertilizers by farmers and, to some extent, to effluents from domestic sewage systems. Health effects of groundwater contamination by nitrates have been assessed several times and may lead to important consequences for infants. Following pressures from citizens in 1990, a survey of well water quality around potato fields of the Portneuf county (Québec) found that nitrate contamination was frequently above the 10 mg-N/1 standard. Because this first survey was limited to areas of intensive potato culture, it was not possible to evaluate the real impact on the groundwater quality for the whole county and the subsequent public health intervention was spread over the entire region. A second survey was carried out in 1995 to reevaluate the situation using random sampling methods. This latter study took into account drinking water habits of the population, the relative importance of potato culture as a source of nitrogen loading, the effects of soil types, and waste-water disposal systems as well as land use on nitrate concentration in private well water. The data analysis was carried out by combining GIS and statistical methods to test hypotheses about the spatial relationship linking measured nitrate concentrations with their immediate environment. This paper presents the major findings from this second study which confirm the impact of intensive potato culture on groundwater nitrate concentrations, mainly localized in sandy soil areas within 2 km of fields. Finally, it illustrates the usefulness of GIS to focus public health interventions.

Kuo, H.W., Chiang, T.F., Lo, I.I., Lai, J.S., Chan, C.C. and Wang, J.D. (1998), Estimates of cancer risk from chloroform exposure during showering in Taiwan. *Science of the Total Environment*, **218** (1), 1-7.

Full Text: [S\Sci Tot Env218, 1.pdf](S/Sci%20Tot%20Env218,%201.pdf)

Abstract: The purpose of this study was to compare the cancer risk, with chloroform exposure during showering. The study concentrated on the three major metropolitan areas of Taiwan. Total exposure was measured based on a combination of ingestion, inhalation and skin absorption. A total of 137 tap water samples were taken from 26 locations within the Taipei (north), Taichung (central) and Kaohsiung (south) areas. Analysis of VOC compounds was performed according to the US EPA Method 524. Chloroform concentrations were highest in Kaohsiung (60.19 µg/l), followed by Taipei (18.83 µg/l) and Taichung (17.55 µg/l). Based on the two-resistance theory to volatilization in showers, when air flow rate is increased, chloroform concentrations in the air significantly decrease. A 10-min shower would result in chloroform exposure with a 3: 4: 3 ratio (ingestion, inhalation, skin absorption). However, that changes to 1: 7: 2 for a 20-min shower under the same conditions. The cancer risk was highest in Kaohsiung at 17.59 per million for a 10-min shower and 64.77 per million for a 20-min shower. The lowest cancer risk was found in Taichung at 4.99 and 11.50 per million for a 10-and 20-min shower, respectively. Although ingestion is commonly considered to be the primary source of exposure to chloroform from tap water, inhalation and skin absorption exposure concentrations were found to be even higher. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: Chloroform, Cancer Risk, Showering, Drinking-Water, Contaminated Water, Organic-Chemicals, Trihalomethanes, Volatilization, Inhalation, Outcomes, Model, Home

Schuhmacher, M., Domingo, J.L., Llobet, J.M., Sünderhauf, W. and Müller, L. (1998), Temporal variation of PCDD/F concentrations in vegetation samples collected in the vicinity of a municipal waste incinerator (1996-1997). *Science of the Total Environment*, **218** (2-3), 175-183.

Full Text: [S\Sci Tot Env218, 175.pdf](S/Sci%20Tot%20Env218,%20175.pdf)

Abstract: In 1996, the concentrations of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) were determined by HRGC/HRMS in 24 vegetation samples collected in the vicinity of a municipal solid waste incinerator (Tarragona, Catalonia, Spain). In the present study 24 vegetation samples were again taken at the same sampling points and analyzed for the levels of PCDD/Fs. The results were compared with those obtained in the previous survey. While in the 1996 study, PCDD/F levels ranged from 0.15 to 62.09 ng I-TEQ/kg (dry matter) (median value, 0.33 ng I-TEQ/kg, mean value, 4.11 ng I-TEQ/kg), the concentrations of PCDD/Fs in the 1997 survey ranged between 0.11 and 0.50 ng I-TEQ/kg (dry matter) (median value, 0.20 ng I-TEQ/kg, mean value, 0.23 ng I-TEQ/kg). The individual comparison between PCDD/F levels in the samples collected in 1996 and 1997 showed a decrease in 15 of the 24 sampling points. When the comparison was carried out in relation to each of the four main wind directions in the area, the highest decrease in PCDD/F concentrations (64%) corresponded to samples in the SE direction, while those in the NE direction showed also a notable reduction in total I-TEQ (44%). In contrast, PCDD/F levels in vegetation samples from NW and SW directions were increased (37% and 6%, respectively). When the data were evaluated according to the distance of the sampling points to the plant, the highest decrease in total I-TEQ was found at 500 m from the stack. The results of this study seem to provide evidence for a decline in atmospheric emissions of PCDD/Fs in the area of Tarragona. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: PCDD/PCDF, Vegetation, Municipal Solid Waste Incinerator, Temporal Variation, Dibenzo-p-Dioxins, Solid-Waste, Human Exposure, Emissions, Air, UK, Environment, Deposition, PCDF, Contamination

Usuda, K., Kono, K., Dote, T., Miyata, K., Nishiura, H., Shimahara, M. and Sugimoto, K. (1998), Study on urine boron reference values of Japanese men: Use of confidence intervals as an indicator of exposure to boron compounds. *Science of the Total Environment*, **220** (1), 45-53.

Full Text: [S\Sci Tot Env220, 45.pdf](S/Sci%20Tot%20Env220,%2045.pdf)

Abstract: A simple and rapid method for the determination of urine boron by inductively-coupled plasma argon emission spectrometry (ICPAES) has been developed to establish boron exposure guidelines. After 11-fold dilution in 18.25 M omega cm ultra-pure water and vigorous shaking, urine may be directly injected into the spectrometer, providing accurate and reproducible results. We report the results obtained with urine samples obtained from a group of male Japanese electronic workers (n = 102) who had not been exposed to boron, boron concentrations were corrected with use of a specific gravity of 1.024 g/ml. The frequency distribution resulted in a log-normal distribution diagram for anatomical spread. The geometric mean values for urine boron in the non-exposed workers was 798.0 micrograms/l, while the confidence interval (C.I.) was between 398.1 and 1599.6 micrograms/l. Taking into consideration the short biological half-life of boron and its major excretion route via urine, urine was considered to be a suitable means for monitoring of exposure to this element. We conclude that the guidelines established by determining boron reference values are useful for the protection of individuals exposed to boron in their working environments.

Nriagu, J.O., Wong, H.K., Lawson, G. and Daniel, P. (1998), Saturation of ecosystems with toxic metals in Sudbury basin, Ontario, Canada. *Science of the Total Environment*, **223** (2-3), 99-117.

Full Text: [S\Sci Tot Env223, 99.pdf](S/Sci%20Tot%20Env223,%2099.pdf)

Abstract: Mining and resource recovery activities have not been kind to ecosystems in the Sudbury basin, Ontario. The combination of logging, smelting, fires and erosion resulted in an unusual anthropogenic ecosystem of denuded barren land with lifeless lakes, or a micro-desert. Since the 1970s, however, the concerted efforts made to reduce the emissions and rehabilitate parts of the degraded ecosystem have resulted in improvements in water quality, and recoveries in phytoplankton, zooplankton, zoobenthos and fish communities but have had little impact on toxic metal concentrations in many lakes. We show that most of the catchments in the Sudbury basin have become saturated with Cu and Ni, and some with Zn and Pb. It is estimated that mobilization of metals stored in soils and glacial overburden by surface runoff, groundwater drainage and wind re-working of tailings can sustain the high concentrations of Cu and Ni in many lakes for well over 1000 years. Strategies to immobilize the pollutant metals in the watershed rather than further emission controls may be required for dealing with high levels of toxic metals in surface waters of the saturated ecosystems.

Miranda, C.D. and Castillo, G. (1998), Resistance to antibiotic and heavy metals of motile aeromonads from Chilean freshwater. *Science of the Total Environment*, **224** (1-3), 167-176.

Full Text: [S\Sci Tot Env224, 167.pdf](S/Sci%20Tot%20Env224,%20167.pdf)

Abstract: In this work the resistance of 172 motile Aeromonas isolates recovered from raw drinking water supplies (56), irrigation waters (60) and runoff waters receiving sewage (56), to some antibiotics and heavy metals was investigated by agar diffusion and agar dilution methods. A high proportion of isolates from all water sources showed resistance to carbenicillin, erythromycin, streptomycin, cephradine and cadmium, and susceptibility to chloramphenicol, kanamycin, gentamicin, tetracycline, nalidixic acid, trimethoprim-sulphametoxazole and chromium. No amikacin-resistant Aeromonas were recovered. No relationship was found between antimicrobial resistance and Aeromonas species, with the exception of cephradine, that exhibited a significantly higher activity against the A. sobria isolates than the other Aeromonas species (P < 0.05). Moderately polluted waters showed lower antibiotic multiresistance and metal susceptibility than unpolluted and highly polluted ones. Although significant differences (P < 0.05), between resistance frequencies to erythromycin, carbenicillin, streptomycin and cephradine were found, Among isolates from different sources, the antimicrobial resistance patterns of aeromonads could not be related to the level of faecal pollution. These results indicate that aeromonads resistant to antibiotics and heavy metals are easily recovered from water sources in Chile, posing a potential public health risk.

Notes: highly cited

Notes: highly cited

? Ternes, T.A., Stumpf, M., Mueller, J., Haberer, K., Wilken, R.D. and Servos, M. (1999), Behavior and occurrence of estrogens in municipal sewage treatment plants - I. Investigations in Germany, Canada and Brazil. *Science of the Total Environment*, **225** (1-2), 81-90.

Full Text: [1999\Sci Tot Env225, 81.pdf](1999/Sci%20Tot%20Env225,%2081.pdf)

Abstract: The developed method enables the quantification of estrogens in sewage samples down to 1 ng/l and in river water down to 0.5 ng/l. Mean recoveries of the analytes in ground water after SPE extraction, clean-up and derivatization generally exceeded 75%. The determined R.S.D. varied from 0 to 14% at a spiking revel of 0.05 mu g/l. Even in the raw influent and the final effluent from municipal STPs the mean recoveries of estrogens were mostly above 70%. Using this method the behavior and occurrence of natural estrogens and synthetic contraceptives in municipal sewage treatment plants (STP) were investigated in German and Canadian facilities. In the sewage of a German municipal STP close to Frankfurt/Main 17 beta-estradiol and estrone were determined, with mean concentrations of 0.015 mu g/l and 0.027 mu g/l, respectively. In two investigated municipal STPs, 17 beta-estradiol and 16 alpha-hydroxyestrone were eliminated with a higher efficiency than 17 alpha-ethinylestradiol and estrone. In Canadian and German STP discharges estrone, 17 beta-estradiol, 17 alpha-ethinylestradiol and 16a-hydroxyestrone were frequently detected within the lower ng/l-range. A maximum concentration was found for estrone with 70 ng/l. In 15 investigated German rivers and streams only estrone was present with a maximum concentration of 1.6 ng/l. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Aquatic Environment, Behavior, Brazil, Canada, Concentration, Contraceptives, Discharges, Efficiency, Estrogens, Extraction, Facilities, Gc, Ms, Ms, Germany, Ground Water, Natural, Plants, Quantification, Rights, River, River Water, Rivers, Rivers And Streams, Science, Sewage, Sewage Treatment Plants, Streams, Treatment, Vitro, Water

Notes: highly cited

? Belfroid, A.C., Van der Horst, A., Vethaak, A.D., Schafer, A.J., Rijs, G.B.J., Wegener, J. and Cofino, W.P. (1999), Analysis and occurrence of estrogenic hormones and their glucuronides in surface water and waste water in The Netherlands. *Science of the Total Environment*, **225** (1-2), 101-108.

Full Text: [1999\Sci Tot Env225, 101.pdf](1999/Sci%20Tot%20Env225,%20101.pdf)

Abstract: An analytical procedure was developed that enables routine analysis of four estrogenic hormones in concentrations below 1 ng/l in surface water and waste water. The recovery was 88-98% with a limit of detection of 0.1-2.4 ng/l depending on the compound and the matrix measured. This method was used to determine the occurrence of 17 beta-estradiol, 17 alpha-estradiol, estrone and 17 alpha-ethinylestradiol in the aquatic environment in The Netherlands. The data show that estrogenic hormones can be detected at low concentrations (up to 6 ng/l) at some locations in surface water. In selected effluents of waste water treatment plants estrone and 17 beta-estradiol were detected in concentrations in the ng/l range. Concentrations of 17 alpha-estradiol and the contraceptive 17 alpha-ethinylestradiol were in most of these samples below the limit of detection. Hormone glucuronides were not detected in most surface water and effluents. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Analysis, Aquatic, Aquatic Environment, Chromatography, Data, ECO-Hormones, Effluents, Endocrine Disruptors, Environment, Estradiol, Estrogen, Ethinylestradiol, Hormones, Matrix, Plants, Procedure, Recovery, Rights, Science, Surface, Surface Water, The Netherlands, Treatment, Urine, Waste, Waste Water, Waste Water Treatment, Water, Water Treatment

? Hirsch, R., Ternes, T., Haberer, K. and Kratz, K.L. (1999), Occurrence of antibiotics in the aquatic environment. *Science of the Total Environment*, **225** (1-2), 109-118.

Full Text: [1999\Sci Tot Env225, 109.pdf](1999/Sci%20Tot%20Env225,%20109.pdf)

Abstract: The recent monitoring of drug residues in the aquatic environment has gained much interest as many pharmaceutical compounds can frequently be found in sewage treatment plant (STP) effluents and river water at concentrations up to several μg/l. This article describes the analysis of various water samples for 18 antibiotic substances, from the classes of macrolid antibiotics, sulfonamides, penicillins and tetracyclines. Samples were preconcentrated via lyophilization and quantified using HPLC-electrospray-tandem-mass spectrometry. The investigated STP effluents and surface water samples showed frequent appearance of an erythromycin degradation product, roxithromycin and sulfamethoxazole with concentrations up to 6 μg/l. Neither tetracyclines nor penicillins could be detected at concentration levels above 50 and 20 ng/l, respectively. From the large number of ground water samples that were taken from agricultural areas in Germany, no contamination by antibiotics was detected except for two sites. This indicates that intake from veterinary applications to the aquatic environment is of minor importance. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Tetracyclines, Macrolid Antibiotics, Penicillins, LC-MS/MS, Coliform Bacteria, Drug-Resistance, Drinking-Water, Oxytetracycline, Sediments, Sewage, River

Shahwan, T., Erten, H.N., Black, L. and Allen, G.C. (1999), TOF-SIMS study of Cs+ sorption on natural kaolinite. *Science of the Total Environment*, **226** (2-3), 255-260.

Full Text: [S\Sci Tot Env226, 255.pdf](S/Sci%20Tot%20Env226,%20255.pdf)

Abstract: The sorption of Cs+ on natural kaolinite has been studied using time-of-flight secondary ion mass spectrometry (TOF-SIMS). Depth profiling up to 70 Angstrom was performed to study the change in the amount of sorbed Cs+ as a function of depth in the kaolinite matrix. Quantitative determination of the amounts of primary cations in the kaolinite structure before and after sorption of Cs+ ions was carried out to identify which cations are possibly taking part in the sorption process. The experimental results showed that large amounts of Cs+ are sorbed onto the surface of kaolinite and that sorption decreases sharply over the first 10-Angstrom depth. The fact that kaolinite surface was negatively charged under the operating pH indicates that physisorption has an important contribution to the sorption process. The results also showed that Na+, K+, Li+, Ca2+, Mg2+ and Fe3+ were involved in the sorption process with Cs+ and that the total decrease in the amounts of these cations is close to the amount of sorbed Cs+, suggesting that ion exchange is the dominant sorption mechanism. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Sorption, Kaolinite, Migration, Radionuclides, Tof-Sims, Depth-Profiling, Desorption

Chatterjee, A. and Banerjee, R.N. (1999), Determination of lead and other metals in a residential area of greater Calcutta. *Science of the Total Environment*, **227** (2-3), 175-185.

Full Text: [S\Sci Tot Env227, 175.pdf](S/Sci%20Tot%20Env227,%20175.pdf)

Abstract: The aim of the study was to determine the major source and extent of metal pollution in a residential area of Greater Calcutta. In this area approximately 50,000 people reside in the vicinity of a lead factory that produces lead ingots and lead alloys. Many people, especially children, are affected by lead toxicity. Soils, waters, road dust, leaf dust, leaves and pond sediments were sampled in and around the factory area. Aliquots of the samples were mineralized with nitric acid and hydrogen peroxide in a microwave system. Lead and 19 other elements were quantified in the digests by inductively coupled plasma mass spectrometry. The performance of the procedure was confirmed by analyzing NBS-BCR standard reference soil, leaves, sediment samples. The soils are highly contaminated not only with lead (4.7%), but also with Cd (0.08%), Ag (0.001%), Cu (0.02%), Zn (1.0%), As (1.0%), Mo (0.003%), Sn (0.003%) and Hg (0.03%) (metal concentrations given in parentheses are maximum). Moving away from the smelter, most of metal concentrations, especially Pb, As, Mo, Cu, Hg, Zn, Cd, Sn and Ag, decreased exponentially over increasing distance. In the residential areas near the smelter, notably to the west side of the factory, metal concentrations significantly breached the threshold trigger values set in India by the Central Pollution Control Board (CPCB). Particulate materials from the smelter stack appear to contaminate soils up to at least 0.5 km. However, abnormally high metal levels in the immediate smelter area may be due to primarily fugitive emissions. The surface waters are only contaminated by arsenic ranges from 0.05 to 13.5 mg/l, but the ground water is currently not polluted by lead and arsenic. An appropriate treatment plant with some intervention measures should be taken to save the locality.

Tripathi, R.M., Raghunath, R., Sastry, V.N. and Krishnamoorthy, T.M. (1999), Daily intake of heavy metals by infants through milk and milk products. *Science of the Total Environment*, **227** (2-3), 229-235.

Full Text: [S\Sci Tot Env227, 229.pdf](S/Sci%20Tot%20Env227,%20229.pdf)

Abstract: Concentrations of the essential elements Zn and Cu and potentially toxic elements Pb and Cd in different milk samples and baby food materials were measured, primarily to assess whether the intakes comply with recommended desired levels for essential and permissible levels for toxic elements. The geometric mean concentrations of Pb, Cd, Cu and Zn in different types of milk were found to vary from 1.70 to 3.35, 0.07 to 0.10, 43.2 to 195 and 1772 to 4230 µg/l, while the same in different baby foods had values from 39.5 to 77.7, 0.45 to 17.7, 1106.3 to 3157.3 and 9367 to 34592 µg/kg, respectively. The concentration of Cd was found to be very low (0.1 µg/l) and fairly constant in all types of milk. The lead content in cow milli was observed to be the lowest even in comparison with breast milk. Concentrations of all these metals are approximately one order of magnitude higher in baby food products than those observed in different types of milk owing to higher fat content. The infant baby food Amul Spray contains low concentrations of toxic (Pb and Cd) and high concentrations of essential (Cu and Zn) elements. The daily intakes of Pb, Cd, Cu and Zn by infants through milk and baby foods marketed in Mumbai city have also been estimated. The daily intakes of Pb (1.1 µg/kg) and Cd (0.01 µg/kg) for infants through baby foods are well below the recommended tolerable levels of 3.57 µg/kg and 0.8-1.0 µg/kg, respectively. Similarly the daily intake levels of essential elements are also significantly lower than the recommended desirable levels of 3-5 mg and 0.5-1.0 mg for Zn and Cu, respectively. Milk from an Indian mother also does not provide adequate levels of essential elements to the infants and children. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Heavy Metals, Baby Food, Human Milk, Breast Milk, Infant Food, Formula Food, Trace Elements, Lead, Cadmium, Copper, Zinc, Dietary-Intake, Copper, Blood, Zinc

Hokka, P., Palosuo, H., Zhuravleva, I., Parna, K., Mussalo-Rauhamaa, H. and Lakomova, N. (1999), Anxiety about environmental hazards among teenagers in Helsinki, Moscow and Tallinn. *Science of the Total Environment*, **234** (1-3), 95-107.

Full Text: [S\Sci Tot Env234, 95.pdf](S/Sci%20Tot%20Env234,%2095.pdf)

Abstract: Comparative research of environmental attitudes has concentrated on adults of Western countries, whereas knowledge of environmental consciousness of East European people is modest. This article compares anxiety that teenagers in Helsinki, Moscow and Tallinn express about environmental hazards and their health effects. The data (Helsinki, N = 1396, Moscow, N = 618, Tallinn, N = 1268) were collected in schools by questionnaires from pupils between 13 and 18 years in 1994-1995. Air pollution, water pollution and survival of plant and animal species were considered most worrying environmental threats in every city. Environmental concern was usually highest in Moscow, but the effects of pollution on an individual’s health worried Estonian teenagers most. The worry was most consistent in Moscow, where sex, class level or opinion of the state of one’s own living environment did not usually have an effect on attitudes. Finnish girls and pupils in higher school classes were environmentally more conscious than boys or younger teenagers. In Tallinn, the sex and age differences in worry were smaller. Environmental worry seemed to have connections to a general sense of responsibility and risk behaviour such as heavy drinking and smoking. For all sites those pupils who often throw empty packages onto the street or into the nature expressed lower environmental concern than their more responsible peers. The differences of worry between the cities were difficult to interpret, but the greater total concern of young Muscovites may be part of their general social anxiety, which is associated with the instability of the Russian society. (C) 1999 Elsevier Science B.V. All rights reserve.

Keywords: Environment, Attitudes, Young People, Finland, Russia, Estonia

García-Sánchez, A., Alastuey, A. and Querol, X. (1999), Heavy metal adsorption by different minerals: Application to the remediation of polluted soils. *Science of the Total Environment*, **242** (1-3), 179-188.

Full Text: [S\Sci Tot Env242, 179.pdf](S/Sci%20Tot%20Env242,%20179.pdf)

Abstract: We studied the heavy-metal adsorption capacity of various minerals in order to evaluate their potential for the reduction of metal mobility and bioavailability and their possible application for the remediation of polluted soils in the Guadiamar valley. The study (batch tests) of zinc adsorption capacity of clays (sepiolites, palygorskites, and bentonite from different mineral deposits) and a soil unaffected by the toxic spill at the P3 site (Puente las Doblas) showed a relative low adsorption capacity for Zn2+. In the case of the sepiolite from Orera deposit, the maximum retention capacity was obtained for Cd2+ (8.3 mgg-1), followed by Cu2+ (69 mgg-1), and finally Zn2+ (5.7 mgg-1). We conclude that the capacity of adsorption of the clays and soil P3 is insufficient to immobilise heavy metals because of the high pollution levels of the soils in the Guadiamar valley. Only goethite (from Cerro del Hierro and Sierra de la Culebra) has sufficient adsorption capacity (between 3 and 4 mgg-1) to immobilise As in the highly polluted soil. Zeolite (NaP1), synthesised from Los Barrios fly ash, showed high retention efficiency for monovalent and divalent cations. Thus, the leaching and ionic exchange tests performed with mixtures of soil with pyrite slurry and NaP1 zeolites showed a high reduction on the mobility of Tl, Zn, Cd, Mn and Co (between 63 and 100%). The retention efficiency (for some of the metals considered) depended, not only on the ionic exchange capacity of the NaP1 zeolite, but also on the decrease of the acidity induced by the zeolitic product.

Keywords: Fly-Ash, Arsenate Adsorption, Contaminated Soils, Zinc, Cadmium, Zeolite, Copper, Lead, Aluminum, Plants, Polluted Soils, Heavy Metals, Clays, Fe Oxides, Nap1 Zeolites, Adsorption Capacity

Misund, A., Frengstad, B., Siewers, U. and Reimann, C. (1999), Variation of 66 elements in European bottled mineral waters. *Science of the Total Environment*, **243-244**, 21-41.

Full Text: [S\Sci Tot Env244, 21.pdf](S/Sci%20Tot%20Env244,%2021.pdf)

Abstract: Fifty-six bottled mineral waters bought at random all over Europe were analysed for 66 chemical elements by ICP-AES, ICP-MS and IC-techniques. Results show that there is a wide spread in the chemical composition of mineral waters. The EEC drinking water safeguard values for chemical constituents do not apply to mineral water, although mineral water is increasingly used for general drinking water purposes. Only 15 of the randomly selected 56 mineral waters would fulfil the drinking water regulations for all parameters where action levels are defined. Differences in chemical composition observed between countries or regions are due to geological environment and to different taste or local regulations of what is mineral water. There are indications that element concentrations for some unwanted constituents (e.g. Pb) are higher in waters sold in glass bottles than in those in plastic bottles. Some elements show a clear regional dependency. Studying the large natural variation in concentration for many of the 66 studied elements it becomes clear that we know little about the natural variation of element concentration in water and the health effects of most elements in drinking water. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Mineral Water, Trace Elements, ICP-MS, Action Level, MAC, Drinking Water, Biggest Arsenic Calamity, Drinking-Water, Ground-Water, Norwegian Groundwaters, Bedrock Groundwaters, Affected People, Trace-Elements, West-Bengal, ICP-MS, Chemistry

Lekouch, N., Sedki, A., Bouhouch, S., Nejmeddine, A., Pineau, A. and Pihan, J.C. (1999), Trace elements in children’s hair, as related exposure in wastewater spreading field of Marrakesh (Morocco). *Science of the Total Environment*, **243-244**, 323-328.

Full Text: [S\Sci Tot Env243-244, 323.pdf](S/Sci%20Tot%20Env243-244,%20323.pdf)

Abstract: Lead and cadmium concentration was determined in the hair of 327 school children living in a wastewater spreading field of Marrakesh (Morocco). The influence of age, sex, food habits and family occupation on the children’s hair Pb and Cd concentration was also evaluated. Girls had more metal in their hair than boys (16.5±5.4 µg/g and 12.5±3.5 µg/g, respectively). However, for Cd the boys had more metal (2.9±0.6 and 2.2±0.4, respectively) but the difference was not statistically significant and metal levels decreased with age. Family occupation, direct contact with wastewater, customs and food habits were the most significant factors influencing the metal content of children’s hair. The average Pb and Cd content were higher in the exposed children (14.8±4.5 µg/g and 2.5±0.5 µg/g, respectively) than in the non-exposed children (4.6±2.2 µg/g and 0.6±0.2, respectively), but the difference was not statistically significant. This study shows that in this area all the population (especially children) was extremely exposed to the danger caused by potentially toxic metals. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Wastewater, Trace Elements, Children, Hair, Metals, Lead

Lin, T.F. and Hoang, S.W. (2000), Inhalation exposure to THMs from drinking water in south Taiwan. *Science of the Total Environment*, **246** (1), 41-49.

Full Text: [S\Sci Tot Env246, 41.pdf](S/Sci%20Tot%20Env246,%2041.pdf)

Abstract: Trihalomethanes (THMs) are important disinfection byproducts (DBPs) in drinking water. To understand the magnitude of exposure to THMs for the people in southern Taiwan, models are used to estimate the inhalation exposure associated with drinking water based on raw water quality. Two parts of models are used in this study, one for estimating THM concentration from raw water quality, and one for estimating inhalation exposure to people. Important raw water quality and operational parameters, including TOC, UV254, pH, temperature, chlorine dosage, and water residence time of a major water treatment plant in south Taiwan were collected. An empirical THM formation model was then employed to predict the THM concentration at consumers’ dwellings based on the parameters collected. Differences between the predicted results and experimental data were found to be small, indicating that the model is appropriate. The predicted THM concentration distribution was served as input parameters for the exposure models. Three major scenarios associated with probable inhalation exposure of THMs, including shower, pre-and post-cooking activities, and cooking processes, were considered in the exposure models. The model results show that the mean inhalation exposure of THMs for shower, pre-and post-cooking activities, and cooking processes are 26.4, 1.56, 3.29 µg/day, respectively. The total inhalation exposure (summation of the three scenarios) was found to be comparable with that for direct ingestion, indicating that inhalation is an important pathway for THM exposure from drinking water. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Trihalomethanes (THMs), Drinking Water, Inhalation Exposure, Trihalomethane Formation, Volatilization, Model

Kim, M.J. and Nriagu, J. (2000), Oxidation of arsenite in groundwater using ozone and oxygen. *Science of the Total Environment*, **247** (1), 71-79.

Full Text: [S\Sci Tot Env247, 71.pdf](S/Sci%20Tot%20Env247,%2071.pdf)

Abstract: Oxidation of arsenite [As(III)] with ozone and oxygen was investigated in groundwater samples containing 46-62 micrograms/l total dissolved arsenic, 100-1130 micrograms/l Fe and 9-16 micrograms/l Mn. Conversion of As(III), which constituted over 70% of dissolved arsenic in the samples, to As(V) was fast with ozone, but sluggish with pure oxygen and air. Iron and manganese in the samples were also oxidized and, by sequestering the resultant As(V), played a significant role in the rate of reaction. Sorption capacity of freshly precipitated Fe(OH)3 was estimated to be 15.3 mg As/g. The kinetics of As(III) oxidation were interpreted using modified pseudo-first-order reaction. Half-lives of As(III) in experimental solutions involving saturation with each gas were approximately 4 min for the ozone reaction and, depending on the Fe concentrations, 2-5 days for pure oxygen and 4-9 days for air.

Keywords: Ion-Exchange, Arsenic(III), Adsorption, Removal, Oxides, Waters, Arsenate(III), Precipitation, Stability, Sorption, Arsenic, Arsenite, Groundwater, Oxidation, Ozone, Oxygen

Ngabe, B., Bidleman, T.F. and Scott, G.I. (2001), Polycyclic aromatic hydrocarbons in storm runoff from urban and coastal South Carolina. *Science of the Total Environment*, **255** (1-3), 1-9.

Full Text: [S\Sci Tot Env255, 1.pdf](S/Sci%20Tot%20Env255,%201.pdf)

Abstract: Stormwater runoff was collected in urbanized areas of South Carolina to investigate the levels and sources of polycyclic aromatic hydrocarbons (PAHs). Mean concentrations of total PAHs in runoff (ΣPAHs, 14 compounds), determined by gas chromatography–mass spectrometry, were 5590 ng/l in the city of Columbia and 282 ng/l in the coastal community of Murrells Inlet. Lower concentrations were found in estuarine water at Murrells Inlet (mean=35 ng/l) and at undeveloped North Inlet estuary (13 ng/l). The PAH profiles in Columbia and Murrells Inlet runoff were similar to those of atmospheric particulate matter and unlike those in used crankcase oil. Examination of the aliphatic fraction of Columbia runoff samples by gas chromatography with flame ionization detection showed patterns that were more similar to used crankcase oil than to urban aerosols.

Keywords: Polycyclic Aromatic Hydrocarbons, Urban Runoff, Estuaries, South Carolina

Chick, S.E., Koopman, J.S., Soorapanth, S. and Brown, M.E. (2001), Microbial interactions with tributyltin compounds: Detoxification, accumulation, and environmental fate. *Science of the Total Environment*, **258** (1-2), 119-127.

Full Text: [S\Sci Tot Env258, 119.pdf](S/Sci%20Tot%20Env258,%20119.pdf)

Abstract: While inorganic forms of tin are of relatively low toxicity towards microorganisms, the more lipid-soluble organotins can be highly toxic. Generally, trisubstituted (R3SnX) organotins are more toxic than di- (R2SnX2) and monosubstituted (RSnX3) compounds, the anion (X) apparently having little influence on toxicity. However, many microorganisms exhibit resistance to organotins, a phenomenon of relevance to the environmental cycling of organotins and also to novel biological methods of treatment. Organotin degradation can involve the sequential removal of organic moieties to yield less toxic derivatives, e.g. debutylation of tributyltin compounds to di- and monobutylins. Such degradation is known to take place in bacteria, algae and fungi, and this provides one route for detoxification. In addition, microorganisms are capable of accumulating tributyltin compounds, and this is another mechanism of removal from solution. The high lipid solubility of organotins ensures cell penetration and association with intracellular sites, while cell wall components also play an important role. Of the fungal wall components, melanin pigments are capable of TBT binding, and the addition of melanin to growing cultures can remove toxicity, melanised strains are also more sensitive than albino strains of the same species. To date, little attention has been paid to the biotechnological exploitation of these interactions for the degradation of tributyltin or its removal from solution. This paper describes some interactions of microorganisms (bacteria, cyanobacteria, microalgae, and fungi) with tributyltin compounds, with particular reference to toxicity, bioaccumulation and detoxification. Such processes should receive due consideration in any environmental management programme. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Microorganisms, Organotins, Tributyltin, Toxicity, Detoxification, Accumulation, Biosorption, Estuarine Sediments, Organotin Compounds, Inorganic Tin, Butyltin Compounds, Aquatic Bacteria, Pure Strains, Fresh-Water, Microorganisms, Degradation, Methylation

Chick, S.E., Koopman, J.S., Soorapanth, S. and Brown, M.E. (2001), Infection transmission system models for microbial risk assessment. *Science of the Total Environment*, **274** (1-3), 197-207.

Full Text: [S\Sci Tot Env274, 197.pdf](S/Sci%20Tot%20Env274,%20197.pdf)

Abstract: Chemical risk assessments often focus on measuring exposure as if individuals were subject only to exogenous environmental sources of risk. For infectious diseases, exposure might not only depend on exogenous sources of microbes, but also on the infection status of other individuals in the population. For example, waterborne infections from agents such as *Cryptosporidium* parvum and *Escherichia* coli: O157: H7 might be transmitted from contaminated water to humans through drinking water, from interpersonal contact, or from infected individuals to the environment, and back to other susceptible individuals. These multiple pathways and the dependency of exposure on the prevalence of infection in a population suggest that epidemiological models are required to complement standard risk assessments in order to quantify the risk of infection. This paper presents new models of infection transmission systems that are being developed for the US Environmental Protection Agency as part of a project to quantify the risk of microbial infection. The models are designed to help inform water treatment system design decisions. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Microbial Risk, Infection Transmission System, Epidemic Model, Population Risk, Cryptosporidiosis, Outbreak, Helicobacter, Framework, Milwaukee, Wisconsin, Water

Zietz, B., de Vergara, J.D., Kevekordes, S. and Dunkelberg, H. (2001), Lead contamination in tap water of households with children in Lower Saxony, Germany. *Science of the Total Environment*, **275** (1-3), 19-26.

Full Text: [S\Sci Tot Env275, 19.pdf](S/Sci%20Tot%20Env275,%2019.pdf)

Abstract: Lead has numerous acute and chronic adverse effects on human beings. This is especially true for infants and children. The main path of lead ingestion in children can be different according to housing and living situation. The intake of lead through drinking water is commonly due to metal corrosion. The users plumbing can be an important factor. In recent years, many lead pipes in Germany have been replaced by pipes made of an alternative material. The aim of this study is to assess the present state of drinking water contamination and the resulting exposure of infants to lead. For this purpose mothers of new-born babies were offered a free examination of their drinking water. After a written declaration of consent had been obtained and after the infant in question had reached an age of 3 months, a stagnation sample of cold tap-water after overnight stagnation together with a random daytime sample was obtained from the family. The collected samples were analysed by atomic absorption spectrometry for their lead concentration. In total, 1485 samples from households were collected. of the 1434 stagnation samples, 3.1% had lead concentrations greater than 0.01 mg/l (recommended limit of the WHO) and 0.6% had concentrations above the limit of the German drinking water regulation (0.04 mg/l). The values for the 1474 random daytime samples were 2.1% above 0.01 mg/l and 0.2% greater than 0.04 mg/l, respectively. By region, the areas Bovenden, Friedland, Duderstadt, Northeim and Rosdorf were particularly affected. The highest measured concentrations of lead in the stagnation samples were 0.11 mg/l and 0.15 mg/l in the random daytime samples, respectively. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Lead, Drinking Water, Lead Pipes, Lower Saxony, Blood, Exposure, Health, Determinants, Smelter, Cohort, City, Soil

Tseng, T.K. and Chu, H. (2001), The kinetics of catalytic incineration of styrene over a MnO/Fe2O3 catalyst. *Science of the Total Environment*, **275** (1-3), 83-93.

Full Text: [S\Sci Tot Env275, 83.pdf](S/Sci%20Tot%20Env275,%2083.pdf)

Abstract: Catalytic incineration is one of the cost-effective technologies to deal with unwanted volatile organic compounds (VOCs). Catalytic incineration of styrene over a MnO/Fe2O3 catalyst was carried out in a bench scale catalytic incinerator. Three kinetic models, the power-rate law, the Mars and van Krevelen model and the Langmuir-Hinshelwood model were used to analyze the results. A differential reactor design was used for best fit of kinetic models in this study. The results show that the Langmuir-Hinshelwood model may be feasible to describe the catalytic incineration of styrene. This suggests that the chemical adsorption of either O2 molecules or O atoms is important in the process of catalytic incineration of styrene. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Catalytic Incineration, Kinetics, Mno/Fe2O3, Styrene, Pt/Al2O3 Catalyst, Oxidation, VOCs

? Comber, S.D.W., Franklin, G., Gardner, M.J., Watts, C.D., Boxall, A.B.A. and Howcroft, J. (2002), Partitioning of marine antifoulants in the marine environment. *Science of the Total Environment*, **286** (1-3), 61-71.

Full Text: [2002\Sci Tot Env386, 61.pdf](2002/Sci%20Tot%20Env386,%2061.pdf)

Abstract: The partitioning behaviour of the organic biocides, Irgarol 1051 and diuron and two inorganic biocides (copper and zinc) was investigated using six sediments of differing physico-chemical properties collected from unimpacted sites along the south coast of England. The kinetics of sorption and equilibrium partitioning between the sediments and seawater were investigated over a period of 20 days. Resulting organic carbon/water partition coefficients (log K-oc) were related to suspended sediment concentration and ranged from 2.28 to 5.20 for diuron, and from 2.41 to 4.89 for Irgarol 1051. Sediment/water partition coefficients (log K-p) for copper and zinc varied from 2.46 to 5.08 l/kg and from 2.49 to 4.97 l/kg, respectively. Kinetic data indicated that there were significant interactions between the dissolved and particulate phases at the start of the experiments, just after mixing. This is thought to be a result of redistribution of organic carbon between the two phases. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Antifoulants, Behaviour, Biocides, Cadmium, Carbon, Coast, Coastal Waters, Concentration, Copper, Copper, Data, Dissolved, Diuron, Elsevier Science, England, Environment, Equilibrium, Estuaries, Estuarine, Experiments, Inputs, Interactions, IRGAROL 1051, IRGAROL-1051, K-Oc, Kinetic, Kinetics, Lead, Mar, Marine, Marine Environment, Mixing, Organic, Organic Carbon, Particulate, Partitioning, Rapid-Determination, Redistribution, Rights, Science, Seawater, Sediment, Sediments, Sorption, Suspended Sediment, Trace-Metals, Zinc

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Full Text: [2004\Sci Tot Env326, 217.pdf](2004/Sci%20Tot%20Env326,%20217.pdf)

Abstract: A natural loess soil was modified using a cationic surfactant, hexadecyltrimethylammonium (HDTMA) bromide. Sorption of ionizable organic compounds (IOCs), 2,4-dichlorophenol (DCP), p-nitroaniline (NA) and benzoic acid (BA), on the modified soil was determined under different pH conditions. The objective of this study was to examine the sorptive characteristics of IOCs on HDTMA-modified loess soil as a function of pH in an attempt to establish the sorptive models and mechanisms for predicting the sorptive behaviors of IOCs on the HDTMA-modified loess soil. The sorption isotherms of DCP, NA and BA with the soil were obtained using the batch equilibration method. Results indicated that the sorption isotherms of IOCs, regardless of ionic or neutral forms, were non-linear and obeyed to the Freundlich equation. A model describing the sorption of IOCs on the HDTMA-modified loess soil was derived from the experimental data. The model well predicted the sorption of DCP from individual sorption of both ionic and neutral species of the IOC. In binary solute systems, sorption of NA was reduced in the presence of DCP or BA, which indicated that DCP and BA had a competitive effect on the sorption of NA on the HDTMA-modified loess soil. The effect of DCP on the sorption of NA gradually increased with decreasing pH from 10.8 to 6.7, suggesting a stronger effect of neutral DCP than that of the ionic species on the sorption of NA. Modification of loess soil may effectively immobilize ionizable organic contaminants in soil environment. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Acids, Benzoic Acid, Cationic Surfactant, Clay, Competitive Sorption, Contaminants, Environment, Freundlich, Hdtma, Hexadecyltrimethylammonium, Ionic Species, Ionizable, Isotherms, Loess Soil, Mechanisms, Model, Model Competition, Models, Modified, Na, Natural, Organic, Organic Compounds, Organic Contaminants, pH, Predicting, Soil, Sorption, Sorption Isotherms, Surfactant, Water

? Isidori, M., Lavorgna, M., Nardelli, A., Parrella, A., Previtera, L. and Rubino, M. (2005), Ecotoxicity of naproxen and its phototransformation products. *Science of the Total Environment*, **348** (1-3), 93-101.

Full Text: [2005\Sci Tot Env348, 93.pdf](2005/Sci%20Tot%20Env348,%2093.pdf)

Abstract: The occurrence of pharmaceuticals in the environment is of great concern and only few data are available about the adverse effects of such molecules and their derivatives on non-target aquatic organisms. This study was designed to assess the toxic potential of Naproxen, a nonsteroidal anti-inflammatory, Naproxen Na, its freely water soluble sodium salt and their photoproducts in the aquatic environment. Bioassays were performed on algae, rotifers and microcrustaceans to assess acute and chronic toxicity. Furthermore, possible genotoxic effects of photoderivatives were investigated using SOS chromotest and Ames fluctuation test. The results showed that photoproducts were more toxic than the parent compounds both for acute and chronic values, while genotoxic and mutagenic effects were not found. These findings suggested the opportunity to consider derivatives in ecotoxicology assessment of drugs. (c) 2005 Elsevier B.V All rights reserved.

Keywords: Naproxen, Toxicity Testing, Genotoxicity, Mutagenesis, Environmental Risk-Assessment, Personal Care Products, Aquatic Organisms, Treatment Plants, Sos Chromotest, Algal Toxicity, Waste-Water, Pharmaceuticals, Agents, Drugs

? Kurniawan, T.A., Chan, G.Y.S., Lo, W.H. and Babel, S. (2006), Comparisons of low-cost adsorbents for treating wastewaters laden with heavy metals. *Science of the Total Environment*, **366** (2-3), 409-426.

Full Text: [2006\Sci Tot Env366, 409.pdf](2006/Sci%20Tot%20Env366,%20409.pdf)

Abstract: In this article, the removal performance and cost-effectiveness of various low-cost adsorbents derived from agricultural waste, industrial by-product or natural material are evaluated and compared to those of activated carbon for the removal of heavy metals (Cd(II), Cr(III), Cr(VI), Cu(II), Ni(II) and Zn(II)) from metals-contaminated wastewater. To highlight their technical applicability, selected information on pH, dose required, initial metal concentration, adsorption capacity and the price of the adsorbents is presented. It is evident from the survey of 102 published studies (1984-2005) that low cost adsorbents derived from agricultural waste have demonstrated outstanding capabilities for the removal of heavy metal (Cr(VI): 170 mg/g of hazelnut shell activated carbon, Ni(II): 158 mg/g of orange peel, Cu(II): 154.9 mg/g of soybean hull treated with NaOH and citric acid, Cd(II): 52.08 mg/g of jackfruit), compared to activated carbon (Cd(II): 146 mg/g, Cr(VI): 145 mg/g, Cr(III): 30 mg/g, Zn(II): 20 mg/g). Therefore, low-cost adsorbents can be viable alternatives to activated carbon for the treatment of metals-contaminated wastewater. It is important to note that the adsorption capacities presented in this paper vary, depending on the characteristics of the individual adsorbent, the extent of surface modification and the initial concentration of the adsorbate. In general, technical applicability and cost-effectiveness are the key factors that play major roles in the selection of the most suitable adsorbent to treat inorganic effluent. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Agricultural, Agricultural Waste, Alternatives, Aqueous-Solution, Capacity, Carbon, Cd(II), Characteristics, Citric Acid, Concentration, Cost, Cost Effectiveness, Cost-Effectiveness, Cr(III), Cr(VI), Cr(VI) Removal, Cu(II), Electroplating Waste-Water, Fly-Ash, General, Granular Activated Carbon, Hazelnut Shell, Heavy Metal, Heavy Metals, Heavy-Metal, Hexavalent Chromium, Industrial By-Product, Industry Waste, Information, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Low-Cost Material, Metal, Metal-Contaminated Water, Metals, Modification, Naoh, Natural, Ni(II), Performance, Ph, Red Mud, Removal, Rights, Soybean, Surface, Surface Modification, Survey, Treatment, Trivalent Chromium, Waste, Wastewater, Wastewater Treatment, Wastewaters, Zn(II)

? Ngayila, N., Basly, J.P., Lejeune, A.H., Botineau, M. and Baudu, M. (2007), *Myriophyllum alterniflorum* DC., biomonitor of metal pollution and water quality. Sorption/accumulation capacities and photosynthetic pigments composition changes after copper and cadmium exposure. *Science of the Total Environment*, **373** (2-3), 564-571.

Full Text: [2007\Sci Tot Env373, 564.pdf](2007/Sci%20Tot%20Env373,%20564.pdf)

Abstract: Watermilfoil genus Myriophyllum could be used in ecological surveys as in-situ biomonitors of metal pollution and water quality due to its ability to accumulate chemicals. The copper and cadmium sorption characteristics of Myriophyllum alterniflorum have been investigated. The Langmuir and Freundlich isotherms were used to model the metal sorption isotherms and the monolayer sorption capacities, as obtained by the Langmuir isotherm, were determined to be 13.9 mg/g and 11.1 mg/g for Cu2+ and Cd2+ respectively. Results have been compared with previous works on watermilfoils and are in accordance with those obtained on Myriophyllum spicatum. The sorption of the two metals was time-dependent and the kinetics fitted the pseudo-second-order equation well. The data were discussed in terms of ionic radii and HSAB concept. The phytotoxic effects assessed by classical (i.e. changes in biomass, node length) and photosynthetic pigments content endpoints have been investigated using chemometric techniques leading to an effect of cadmium onto photosynthetic pigments. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aquatic Plants, Biomass, Biomonitor, Biosorption, Cadmium, Chemicals, Chemometric Analysis, Composition, Concept, Copper, Cu2+, Effects, Equilibrium, Exposure, Freundlich, Heavy-Metals, In Situ, Ions, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Metal, Metal Pollution, Metal Sorption, Metals, Model, Myriophyllum Alterniflorum, Photosynthetic Pigments, Phytoaccumulation, Pigments, Pollution, Pseudo-Second-Order, Quality, Sorption, Sorption Isotherms, Spicatum, Surveys, Techniques, Waste, Water, Water Quality

? Guo, H.M., Stuben, D. and Berner, Z. (2007), Arsenic removal from water using natural iron mineral-quartz sand columns. *Science of the Total Environment*, **377** (2-3), 142-151.

Full Text: [2007\Sci Tot Env377, 142.pdf](2007/Sci%20Tot%20Env377,%20142.pdf)

Abstract: The study has investigated the feasibility of using siderite-coated quartz sand and/or hematite-coated quartz sand columns for removing As from water. Arsenic-spiked tap water and synthetic As solution with As concentrations from 200 to 500 mu g/L were used for the experiments. Since three coating methods employed to prepare siderite-coated quartz sand and hematite-coated quartz sand had no significant impact on As adsorption in batch tests, the column fillings were produced by means of the simplest one involving mechanically mixing the Fe mineral with quartz sand. Fixed bed tests show that the combination of siderite-coated quartz sand and hematite-coated quartz sand greatly promoted the column performance in removing As and the presence of As(III) in the influent improved the removal efficiency of the column. The relatively low capacity in treating As-spiked tap water arose from the suppression of FeCO3 dissolution in the presence of high HCO3- concentration (333 mg/L), which consequently limited the formation of fresh Fe(III) oxides. However, the H2O2-conditioning greatly increased As adsorption capacity of the column for remediating As-spiked tap water. The Toxicity Characteristic Leaching Procedure (TCLP) test shows that the spent adsorbents were not hazardous and could be safely disposed of to landfill. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Aquatic Environments, Arsenic, As Species, As(III), Batch, Batch Tests, Desorption, Ferrihydrite, Groundwater, Hematite-Coated Sand, Oxidation, Oxide-Coated Sand, Red Mud, Removal, Siderite-Coated Sand, TCLP, Water

? Vymazal, J. (2007), Removal of nutrients in various types of constructed wetlands. *Science of the Total Environment*, **380** (1-3), 48-65.

Full Text: [2007\Sci Tot Env380, 48.pdf](2007/Sci%20Tot%20Env380,%2048.pdf)

Abstract: The processes that affect removal and retention of nitrogen during wastewater treatment in constructed wetlands (CWs) are manifold and include NH3 volatilization, nitrification, denitrification, nitrogen fixation, plant and microbial uptake, mineralization (ammonification), nitrate reduction to ammonium (nitrate-ammonification), anaerobic ammonia oxidation (ANAMMOX), fragmentation, sorption, desorption, burial, and leaching. However, only few processes ultimately remove total nitrogen from the wastewater while most processes just convert nitrogen to its various forms. Removal of total nitrogen in studied types of constructed wetlands varied between 40 and 55% with removed load ranging between 250 and 630 g N m-2 yr-1 depending on CWs type and inflow loading. However, the processes responsible for the removal differ in magnitude among systems. Single-stage constructed wetlands cannot achieve high removal of total nitrogen due to their inability to provide both aerobic and anaerobic conditions at the same time. Vertical flow constructed wetlands remove successfully ammonia-N but very limited denitrification takes place in these systems. On the other hand, horizontal-flow constructed wetlands provide good conditions for dentrification but the ability of these system to nitrify ammonia is very limited. Therefore, various types of constructed wetlands may be combined with each other in order to exploit the specific advantages of the individual systems. The soil phosphorus cycle is fundamentally different from the N cycle. There are no valency changes during biotic assimilation of inorganic P or during decomposition of organic P by microorganisms. Phosphorus transformations during wastewater treatment in CWs include adsorption, desorption, precipitation, dissolution, plant and microbial uptake, fragmentation, leaching, mineralization, sedimentation (peat accretion) and burial. The major phosphorus removal processes are sorption, precipitation, plant uptake (with subsequent harvest) and peat/soil accretion. However, the first three processes are saturable and soil accretion occurs only in FWS CWs. Removal of phosphorus in all types of constructed wetlands is low unless special substrates with high sorption capacity are used. Removal of total phosphorus varied between 40 and 60% in all types of constructed wetlands with removed load ranging between 45 and 75 g N m-2 yr 1 depending on CWs type and inflow loading. Removal of both nitrogen and phosphorus via harvesting of abroveground biomass of emergent vegetation is low but it could be substantial for lightly loaded systems (cca 100-200 g N m-2 yr-1 and 10-20 g P m-2 yr-1). Systems with free-floating plants may achieve higher removal of nitrogen via harvesting due to multiple harvesting schedule. (C) 2006 Elsevier BN. All rights reserved.

Keywords: Constructed Wetlands, Nitrogen, Phosphorus, Standing Stock, Wastewater, Anaerobic Ammonium Oxidation, Horizontal Subsurface Flow, Fresh-Water Wetlands, Waste-Water, Flooded Soils, Nitrogen Transformations, Phosphorus Retention, Treatment System, Sediments, Denitrification

? Huang, Y., Zhao, X. and Luan, S.J. (2007), Uptake and biodegradation of DDT by 4 ectomycorrhizal fungi. *Science of the Total Environment*, **385** (1-3), 235-241.

Full Text: [2007\Sci Tot Env385, 235.pdf](2007/Sci%20Tot%20Env385,%20235.pdf)

Abstract: This research deals with biodegradation of 1,1,1-trichloro-2,2-bis (4-chlorophenyl) ethane (DDT) by 4 selected ectomycorrhizal fungi (ECMF) species, Boletus edulis, Gomphidius viscidus, Laccaria bicolor, and Leccinum scahrum. The pure culture of the four ECMF species in a DDT environment (5 mg/1) showed that DDT almost completely disappeared from the media after 15 days, but only 40-50% was found being accumulated in mycelia. Further gas chromatography mass spectrometry (GC-MS) test of the hexane extractable metabolites identified that the remaining DDT degraded to 1,1-dichloro-2,2-bis (4-chlorophenyl) ethane (DDD) (retention time 17.39 min) and 4,4-dihlorobenzophenone (DBP) (retention time 14.89 min). Therefore, these results, for the first time, demonstrated that ECMF can degrade DDT through a similar pathway found in white rot fungi. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Biodegradation, Ectomycorrhizal Fungi, DDT, Fish, Degradation, Rhizosphere, Mycorrhiza

? Mosaferi, M., Yunesian, M., Dastgiri, S., Mesdaghinia, A. and Esmailnasab, N. (2008), Prevalence of skin lesions and exposure to arsenic in drinking water in Iran. *Science of the Total Environment*, **390** (1), 69-76.

Full Text: [2008\Sci Tot Env390, 69.pdf](2008/Sci%20Tot%20Env390,%2069.pdf)

Abstract: Prevalence of skin lesions was investigated among 752 participants in eight villages in Kurdistan province in Iran with emphasis on total lifetime intake of arsenic from drinking water (TLIA). The participants were selected from eight villages with different exposure levels using a cluster-sampling technique. TLIA was calculated for each individual taking into account the type of water supply and their mean annual arsenic concentration. The study showed that 49 persons (6.5%) were suffering from hyperkeratosis and 20 persons (2.7%) from hyperpigmentation. The correlation between hyperkeratosis and hyperpigmentation was significant (R=0.32S, p<0.01). Using the logistic regression model it was found that the relationship between TLIA and hyperkeratosis (OR=1.14, 95% CI=1.039-1.249), and hyperpigmentation (OR=1.254, 95% CI=1.112-1.416) was also significant. In conclusion, TLIA can be applied as a reliable indicator for the assessment of exposure. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Arsenic, Drinking Water, Iran, Lifetime Intake, Skin Lesions, Endemic Area, Bangladesh, Ingestion, Contamination, Groundwater, Cancer, Health, Metabolites, Disease, Chile

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Full Text: [2008\Sci Tot Env404, 269.pdf](2008/Sci%20Tot%20Env404,%20269.pdf)

Abstract: Phosphorus (P) may be liberated from lake sediments by reductive dissolution of Fe(OH)3(S) during periods of hypolimnetic anoxia. P, however, remains adsorbed to Al(OH) 3(S) regardless of redox conditions. During chronic or episodic acidification of a catchment, ionic Al is mobilized from soils to receiving waters. A fraction of the mobilized Al may precipitate as a consequence of higher pH of the receiving waters. We hypothesized that phosphorus retention in lake sediments is directly related to the magnitude of Al loading in response to low pH in the watershed. We studied cores representing over 200 years of sediment accumulation in historically acidic Mud Pond and Little Long Pond in eastern Maine, USA. Sequential chemical extractions of sediment were used to assess the history of Al, Fe, and P interactions. Mud Pond is a first-order pond with a pH of similar to 4.7, having acidified slightly in response to anthropogenic acidification from similar to 1930. The inlet stream to Mud Pond has dissolved Al concentrations often exceeding 500 mu g/L, of which more than half is organically-bound. Mud Pond drains into Little Long Pond, a second-order pond with a historical pH of <6, and which has shown little pH or alkalinity response to increases or decreases in atmospheric SO42- input. Sequential extractions show that Al and P are predominantly in the 0.1 M NaOH-extractable fraction in the sediments from both ponds throughout the cores. The concentration of the likely biogenic and non-reactive P within the NaOH fraction increases up core from <30% to similar to 60%. Extractable Fe (<20% of extractable Al) is mainly in the 0.1 M NaOH-extractable fraction, except for the top few cm, which are predominantly in the bicarbonate-dithionite reducible fraction. Accumulation rates of sediment, Al, Fe, and P in both ponds have increased in the last 50-60 yr, but fractions remain in the same proportion. Throughout both sediment cores the molar ratio of specific ALP fractions greatly exceeds 25, and molar ratio of specific Al:Fe fractions greatly exceeds 3, the thresholds proposed by Kopacek et al. [Kopacek J, Borovec J, Hejzlar J, Ulrich K-U, Norton SA, Amirbahman A. Aluminum control of phosphorus sorption by lake sediments. Environ Sci Technol 2005, 39: 8784-89.] for P release during anoxia. The data illustrate a continuous association of P with Al in both ponds during the last two centuries, likely due to the persistent natural acidity of the catchments. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Accumulation, Acidic, Acidification, Acidity, Aluminum, Aluminum, Anthropogenic, Association, Catchment, Catchments, Chemical, Chronic, Concentration, Control, Data, Dissolution, Dissolved, First Order, Geochemistry, History, Iron, Lake, Lake Sediment, Lake Sediments, Lakes, Loading, NaOH, Natural, Oligotrophy, P, P-31 NMR, pH, Phosphorus, Phosphorus Inactivation, Phosphorus Sorption, Pond, Rates, Receiving Waters, Reductive Dissolution, Release, Retention, Rights, Second Order, Second-Order, Sediment, Sediment Fractionation, Sediments, SI, Soils, Sorption, Stream, Thresholds, USA, Waters, Watershed

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Full Text: [2009\Sci Tot Env407, 2474.pdf](2009/Sci%20Tot%20Env407,%202474.pdf)

Abstract: Sonochemical processes have been widely used in chemistry and chemical engineering field. Recently, these processes have found new applications in the environmental field, because of advantages in terms of operational simplicity, secondary pollutant formation and safety. Several studies have reported on sonochemical degradation of organic compounds that are toxic in nature. The objective of this review was to identify and examine some of the studies on sonochmical degradation of chlorinated organic compounds, phenolic compounds and organic dyes. This review also examines the basic theory of sonochemical reactions and the use of sonochemical reactors for environmental applications. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Applications, Azo Dyes, Cavitation, Chlorinated Compound, Compounds, Degradation, Destruction, Dilute Aqueous-Solution, Dyes, Field, High-Frequency, Kinetics, Organic Compounds, Organic Dye, Phenol, Processes, Reactor, Review, Safety, Sonochemical, Sonolytic Degradation, Theory, Toxic, Ultrasonic Irradiation, Ultrasound, Water

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Full Text: [2010\Sci Tot Env408, 1738.pdf](2010/Sci%20Tot%20Env408,%201738.pdf), [2010\Sci Tot Env-Hu1.pdf](2010/Sci%20Tot%20Env-Hu1.pdf)

Abstract: A bibliometric analysis based on Science Citation Index (SCI) published by Institute of Scientific Information (ISI) was carried out to identify the global research related to lead in drinking water field from 1991 to 2007 and to improve the understanding of research trends in the same period. The results from this analysis indicate that there have been an increasing number of annual publications mainly during two periods: from 1992 to 1997 and from 2004 to 2007. United States produced 37% of all pertinent articles followed by India with 8.0% and Canada with 4.8%. Science of the Total Environment published the most articles followed by Journal American Water Works Association and Toxicology. Summary of the most frequently used keywords are also provided. “Cadmium” was the most popular author keyword in the 17 years. Furthermore based on bibliometric results four research aspects were summarized in this paper and the historical research review was also presented. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Articles, Bibliometric, Bibliometric Analysis, Canada, Citation, Copper Corrosion, Corrosion, Corrosion Control, Developing Rat-Kidney, Distribution-Systems, Drinking Water, Elsevier, Environment, Exposure Increases, Global, Heavy-Metals, Historical Review, India, ISI, Lead, Oxidative Damage, Potable Water, Publications, Research, Research Trend, Research Trends, Review, SCI, Science, Science Citation Index, Scientometrics, Stimulus Properties, Stripping Analysis, Trends, United States, Water, Web of Science

? Maliyekkal, S.M., Antony, A.K.R. and Pradeep, T. (2010), High yield combustion synthesis of nanomagnesia and its application for fluoride removal. *Science of the Total Environment*, **408** (10), 2273-2282.

Full Text: [2010\Sci Tot Env408, 2273.pdf](2010/Sci%20Tot%20Env408,%202273.pdf)

Abstract: We describe a novel combustion synthesis for the preparation of Nanomagnesia (NM) and its application in water purification. The synthesis is based on the self-propagated combustion of the magnesium nitrate trapped in cellulose fibers Various characterization studies confirmed that NM formed is crystalline with high phase purity, and the particle size varied in the range of 3-7 nm The fluoride scavenging potential of this material was tested as a function of pH, contact time and adsorbent dose The result showed that fluoride adsorption by NM is highly favorable and the capacity does not vary in the pH range usually encountered in groundwater The effects of various co-existing ions usually found in drinking water, on fluoride removal were also investigated Phosphate was the greatest competitor for fluoride followed by bicarbonate The presence of other ions studied did not affect the fluoride adsorption capacity of NM significantly The adsorption kinetics followed pseudo-second-order equation and the equilibrium data are well predicted by Frendlich equation Our experimental evidence shows that fluoride removal happened through isomorphic substitution of fluoride in brucite. A batch household defluoridation unit was developed using precipitation-sedimentation-filtration techniques, addressing the problems of high fluoride concentration as well as the problem of alkaline pH of the magnesia treated water The method of synthesis reported here is advantageous from the perspectives of small size of the nanoparticle, cost-effective recovery of the material and improvement in the fluoride adsorption capacity. (C) 2010 Elsevier B V All rights reserved.

Keywords: Activated Alumina, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Capacity, Adsorption Kinetics, Application, Aqueous-Solution, Batch, Capacity, Cellulose, Cellulose Fibers, Characterization, Combustion, Combustion Synthesis, Concentration, Cost-Effective, Data, Defluoridation, Drinking Water, Equilibrium, Evidence, Experimental, Fibers, Fluoride, Fluoride Adsorption, Fluoride Removal, Function, Groundwater, Improvement, In-Situ Synthesis, Ions, Kinetics, Magnesia, Magnesium, Magnesium-Oxide, Manganese-Oxide, Metal Nanoparticles, Nanocrystalline Mgo, Nanomagnesia, Nanoparticle, Nanoparticles, Nitrate, Nm, Oxide-Coated-Alumina, Particle Size, pH, Phosphate, Potential, Preparation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Purification, Purity, Range, Recovery, Removal, Rights, Size, Small, Substitution, Synthesis, Techniques, Time, Unique Surface-Chemistry, Water, Water Purification

? Huang, I.B., Keisler, J. and Linkov, I. (2011), Multi-criteria decision analysis in environmental sciences: Ten years of applications and trends. *Science of the Total Environment*, **409** (19), 3578-3594.

Full Text: [2011\Sci Tot Env409, 3578.pdf](file:///H:\Bibliometric%20References\2011\Sci%20Tot%20Env409,%203578.pdf)

Abstract: Decision-making in environmental projects requires consideration of trade-offs between socio-political, environmental, and economic impacts and is often complicated by various stakeholder views. Multi-criteria decision analysis (MCDA) emerged as a formal methodology to face available technical information and stakeholder values to support decisions in many fields and can be especially valuable in environmental decision making. This study reviews environmental applications of MCDA. Over 300 papers published between 2000 and 2009 reporting MCDA applications in the environmental field were identified through a series of queries in the Web of Science database. The papers were classified by their environmental application area, decision or intervention type. In addition, the papers were also classified by the MCDA methods used in the analysis (analytic hierarchy process, multi-attribute utility theory, and outranking). The results suggest that there is a significant growth in environmental applications of MCDA over the last decade across all environmental application areas. Multiple MCDA tools have been successfully used for environmental applications. Even though the use of the specific methods and tools varies in different application areas and geographic regions, our review of a few papers where several methods were used in parallel with the same problem indicates that recommended course of action does not vary significantly with the method applied. Published by Elsevier B.V.

Keywords: Analysis, Decision Making, Decision-Making, Environmental, Environmental Policy, Environmental Sciences, Face, Growth, Information, Intervention, Methodology, Multi-Criteria Decision Analysis, Papers, Review, Risk Management, Science, Sciences, Theory, Trends, Web of Science, Weights

# Title: Science of Tsunami Hazards

Full Journal Title: [Science of Tsunami Hazards](http://epubs.lanl.gov/tsunami/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 8755-6839

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Lander, J.F., Whiteside, L.S. and Lockridge, P.A. (2002), A brief history of tsunamis in the Caribbean Sea. *Science of Tsunami Hazards*, **20** (2), 57-94.

Full Text: [S\Sci Tsu Haz20, 57.pdf](S/Sci%20Tsu%20Haz20,%2057.pdf)

Abstract: The area of the Caribbean Sea is geologically active. Earthquakes and volcanoes are common occurrences. These geologic events can generate powerful tsunamis some of which are more devastating than the earthquake or volcanic eruption itself. This document lists brief descriptions of 91 reported waves that might have been tsunamis within the Caribbean region. Of these, 27 are judged by the authors to be true, verified tsunamis and an additional nine are considered to be very likely true tsunamis. The additional 53 events either are not described with sufficient detail in the literature to verify their tsunami nature or are judged to be reports of other phenomena such as sea quakes or hurricane storm surges which may have been reported as tsunamis. Included in these 91 reports are teletsunamis, tectonic tsunamis, landslide tsunamis, and volcanic tsunamis that have caused major damage and deaths. Nevertheless, in recent history these events have been relatively rare. In the interim since the last major tsunami event in the Caribbean Sea the coastal regions have greatly increased in population. Coastal development has also increased. Today tourism is a major industry that exposes thousands of non-residents to the disastrous effects of a tsunami. These factors make the islands in this region much more vulnerable today than they were when the last major tsunami occurred in this area. This paper gives an overview of the tsunami history in the area. This history illustrates what can be expected in the future from this geologic hazard and provides information that will be useful for mitigation purposes.

Lockridge, P.A., Whiteside, L.S. and Lander, J.F. (2002), Tsunamis and tsunami-like waves of the Eastern United States. *Science of Tsunami Hazards*, **20** (3), 120-144.

Full Text: [S\Sci Tsu Haz20, 120.pdf](S/Sci%20Tsu%20Haz20,%20120.pdf)

Abstract: The threat of tsunamis and tsunami-like waves hitting the eastern United States is very real despite a general impression to the contrary. We have cataloged 40 tsunamis and tsunami-like waves that have occurred in the eastern United States since 1600. Tsunamis were generated from such events as the 1755 Queen Anne’s earthquake, the Grand Banks event of 1929, the Charleston earthquake of 1886, and the New Madrid earthquakes of 1811-1812. The Queen Anne tsunami was observed as far away as St. Martin in the West Indies and is the only known teletsunami generated in this source region.

Since subduction zones are absent around most of the Atlantic basin, tsunamis and tsunami-like waves along the United States East Coast are not generated from this traditional source, but appear, in most cases to be the result of slumping or landsliding associated with local earthquakes or with wave action associated with strong storms. Other sources of tsunamis and tsunami-like waves along the eastern seaboard have recently come to light including volcanic debris falls or catastrophic failure of volcanic slopes, explosive decompression of underwater methane deposits or oceanic meteor splashdowns. These sources are considered as well.

Lander, J.F., Whiteside, L.S. and Lockridge, P.A. (2002), Two decades of global tsunamis - 1982-2002. *Science of Tsunami Hazards*, **21** (3), 3-88.

Full Text: [S\Sci Tsu Haz21, 3.pdf](S/Sci%20Tsu%20Haz21,%203.pdf)

# Title: Science Translational Medicine

Full Journal Title: Science Translational Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [2011\Sci Tra Med3, 84cm13.pdf](2011/Sci%20Tra%20Med3,%2084cm13.pdf)

Abstract: Evaluating individual research performance is a complex task that ideally examines productivity, scientic impact, and research quality-a task that metrics alone have been unable to achieve. In January 2011, the French Academy of Sciences published a report on current bibliometric (citation metric) methods for evaluating individual researchers, as well as recommendations for the integration of quality assessment. Here, I draw on key issues raised by this report and comment on the suggestions for improving existing research evaluation practices.

Keywords: Assessment, Bibliometric, Citation, Evaluation, Google-Scholar, Impact, Impact Factor, Index, Journals, Metrics, Performance, Quality, Quantity, Research, Research Evaluation, Research Performance, Science, Scopus, Web

# Title: ScienceAsia

Full Journal Title: ScienceAsia

ISO Abbrev. Title: ScienceAsia

JCR Abbrev. Title: ScienceAsia

ISSN: 1513-1874

Issues/Year: 4

Language: English

Journal Country/Territory: Thailand

Publisher: Thailands Natl Science & Technology Development Agency

Publisher Address: Public Information Dept, 73/1 Rama VI Rd, Rajdhevee, Bangkok 00000, Thailand

Subject Categories:

Multidisciplinary Sciences: Impact Factor 0.176, 46/59 (2010)

? Allen, M.A. (2010), On the current obsession with publication statistics. *ScienceAsia*, **36** (1), 1-5.

Full Text: [2010\ScienceAsia36, 1.pdf](2010/ScienceAsia36,%201.pdf)

Abstract: Crude publication statistics such as publication counts and impact factors are routinely being employed to assess individuals and institutions. Although they can play a role in an approximate preliminary assessment, using them for anything more is inappropriate due to their over-simplicity and ease of manipulation. Furthermore, it is argued that rewarding scientists for achieving high scores in such number-based evaluations ultimately leads to a slowing of scientific progress. Suggestions are given on how reliance on statistics can be reduced and their manipulation discouraged.

Keywords: Citations, Impact Factor, h-Index, Bibliometrics, Research Assessment, Index, Impact

# Title: Sciencepaper Online

Full Journal Title: [Sciencepaper Online](http://www.paper.edu.cn/home.jsp)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Shi, B. and Liao, X.P. (2005), Preparation mechanism of collagen fiber immobilized tannins and their adsorption behaviors for heavy metal ions. *Sciencepaper Online*, (http://www.paper.edu.cn).

Full Text: [S\Sci Onl 2005 Shi.pdf](S/Sci%20Onl%202005%20Shi.pdf)

Abstract: As a kind of novel adsorption material, collagen fiber immobilized tannin has promised to be an effective adsorbent for removing heavy metal ions from water. In this paper, the mechanism of preparing collagen fiber immobilized tannins was explored and their adsorption behaviors for heavy metal ions were extensively investigated. The results indicated that the formation of the covalent linkage of aldehyde between the nucleophilic sites of tannins and the amino groups of collagen side chains is the reason for solvent extraction resistance and high thermal stability of immobilized tannins. This observation is different from the previous elucidation of collagen-tannin-aldehyde interaction and implies that only condensed tannins, which have rich nucleophilic sites, can be immobilized onto collagen fiber by the described approach. The immobilized condensed tannins were effective in adsorbing Au(III), Th(IV), Cu(II), Pb(II), Cd(II) and Hg(II) from water. For some metal ions, like Au(III) and Hg(II), their adsorption capacities on collagen fiber immobilized tannins were very high, reaching 1500 mgAu/g and 198mgHg/g respectively under proper conditions. The adsorption isotherms of Cu(II), Pb(II), Cd(II) and Hg(II) could be well described by the Freundlich model. But, for the adsorption of Au(III) and Th(IV), the adsorption isotherms could be well described by the Langmuir model. The adsorption kinetics data of Cu(II), Au(III), Hg(II) and Th(IV) could be well fitted by the pseuo-second-order model whilst for that of Pb(II) and Cd(II), no suitable model had been found. These facts suggest that different adsorption mechanisms might be involved in the adsorption processes of these metal ions. The immobilized tannins presented excellent column adsorption properties for metal ions, and the adsorption column could be easily regenerated by using diluted acid solution except for the column adsorbing Au(III).

Keywords: Vegetable Tannin, Collagen Fiber, Immobilized Tannin, Preparation Mechanism, Heavy

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Full Text: [2007\Sci Onl 2007 Zhao.pdf](2007/Sci%20Onl%202007%20Zhao.pdf)

Abstract: This paper focus on the adsorption of phosphorus onto blast furnace slags. Its equilibrium isotherm and kinetic model were investigated by using different models. The Langmuir, Freundlich and Temkin isotherms were applied to describe the experimental isotherm data and the results showed that the Langmuir isotherm was the best to characterize the phosphorus adsorption behavior on the blast furnace slags with the maximum adsorption capacity *m Q* of 1341.6mg/kg. The kinetics studies at different initial phosphorus concentrations showed that greatest amount of phosphorus adsorption were completed during the first 10h. Although the process of phosphorus adsorption as a function of time can be suitably described by first-order and pseudo second-order kinetics, the pseudo second-order kinetics are proved to be the best with the similar qe with the experimental data.

Keywords: Phosphorus Adsorption, Isotherms, Kinetics, Blast Furnace Slags

# Title: Sciences des Aliments

Full Journal Title: Sciences des Aliments

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0240-8813

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Abstract: Up till now, there is very little information on the drying of tropical fruits, in particular of bananas and mangoes. Yet this method of conservation whereby only 60% loss of foodstuff is recorded after harvest, is the most economical to undeveloped and developing nations. Using the dynamic gravimetric method, the sorption and desorption isotherms at 40 and 50degreesC for bananas and 50degreesC for mangoes were experimentally determined. These curves were modelled following a semi-empirical correlation proposed by HENDERSON. The advantage of this correlation method is that it takes into account the influence of temperature. The insensitive effect of temperature ranges of about 10degreesC, as is the case with bananas, was highlighted. Hysteresis between the sorption and desorption, with a maximum amplitude of 4% for bananas and 5% for mangoes, was observed. Consequently, experimental results of drying by forced convection of products tested in thin slices (10 mm thickness for mangoes and thickness of less than 15 mm for bananas) were obtained, using well controlled aeraulic and thermal conditions of air duct (40, 50 and 60degreesC for the temperatures, 0.5, 1.0 and 2.0 m-1 for flow rates). A characteristic curve of drying is built for each product, independently of the different aerothermic conditions. This simplified method makes it possible to simulate the experimental kinetics satisfactorily. One of the peculiarities of our work is to identify a critical moisture which is different from the initial moisture content.

Keywords: Banana, Mango, Sorption Isotherms, Kinetic of Drying, Modelling

# Title: Science’s STKE

Previous Issues of Science Signaling

Back issues of Science Signaling

Full Journal Title: [Science’s STKE](http://stke.sciencemag.org/archive/)

ISO Abbreviated Title:

JCR Abbreviated Title: Sci STKE

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [2006\Sci STK331, 2.pdf](2006/Sci%20STK331,%202.pdf)

Abstract: The validity of experiments based on Forster resonance energy transfer (FRET), an imaging technique widely used to measure protein-protein interactions in living cells, critically depends on the accurate and precise measurement of FRET efficiency. The use of FRET standards to determine FRET efficiency, and a consideration of such factors as how the abundance of FRET acceptors and the stoichiometry of donors and acceptors in a molecular complex can affect measured FRET efficiency, will enhance the usefulness with which FRET experiments can be interpreted.

Keywords: Efficiency, Energy, Experiments, Living, Measurement, Standards, Validity

# Title: Scientia Silvae Sinicae

Full Journal Title: Scientia Silvae Sinicae

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

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Full Text: [2005\Sci Sil Sin41, 106.pdf](2005/Sci%20Sil%20Sin41,%20106.pdf)

Abstract: Applying water, formamide and diiodomethane, as probe liquids to penetrate into pine wood at its capillary and non-capillary sections, respectively, the\dynamic absorption models of wood had been deduced based on recorded absorption curves. Results showed that wood absorbs liquid in both capillary and non-capillary sections following three steps, i.e. both the initial and final steps followed the zero order adsorption rate, while the bulk step was complexly dominated by a first or second order adsorption rate. Moreover, it was also found that the viscosity, polarity and the Lewis acid-base interactions of liquids were main factors to influence wood absorption.

Keywords: Absorption, Adsorption, Adsorption Rate, Capillary, First, Liquid, Models, Second Order, Second-Order, Viscosity, Water, Wood

# Title: Scientific American

Full Journal Title: Scientific American

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

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Notes: highly cited

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Full Text: 1992\Sci Ame267, 66.pdf

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Full Text: [S\Sci Ame283, 58.pdf](S/Sci%20Ame283,%2058.pdf)

# Title: Scientific Horticulture

Full Journal Title: Scientific Horticulture

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0080-7737

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Robertson, R.A. (1962), Peat - Its origin, properties and use in horticulture. *Scientific Horticulture*, **16** (6), 42-51.

# Title: The Scientific Proceedings of the Royal Dublin Society Series A

(Sci. Proc. Roy. Dublin Soc. Ser. A)

Full Journal Title: The Scientific Proceedings of the Royal Dublin Society Series A

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Poots, V.J.P., McKay, G. and Healy, J.J. (1978), Basic dye adsorption on peat. *The Scientific Proceedings of the Royal Dublin Society Series A*, **6** (6), 61-76.

Poots, V.J.P. and McKay, G. (1980), Flow characteristics and parameters relating to the use of peat and wood as cheap adsorbent materials for waste water purification. *The Scientific Proceedings of the Royal Dublin Society Series A*, **6** (15), 409-440.

# Title: Scientist

Full Journal Title: [Scientist](http://infotrac.galegroup.com/itw/infomark/1/1/1/purl=rc18_EAIM_0__jn+%22Scientist%22?sw_aep=jrycal5), [Scientist](http://www.the-scientist.com/2010/)

ISO Abbreviated Title: Scientist

JCR Abbreviated Title: Scientist

ISSN: 0890-3670

Issues/Year: 24

Journal Country United States

Language: English

Publisher: Scientist Inc

Publisher Address: 3600 Market St Suite 450, Philadelphia, PA 19104

Subject Categories:

Multidisciplinary Sciences: Impact Factor

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Full Text: 1988\Scientist2, 19.pdf

Keywords: Articles, Jun, Science

? Pendlebury, D. (1988), The 4 most cited papers - Magic in these methods. *Scientist*, **2** (15), 15.

Full Text: 1988\Scientist2, 15.pdf

Keywords: Methods

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Full Text: 1990\Scientist4, 22.pdf

Keywords: Researchers, Scientists

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Full Text: 1990\Scientist4, 24.pdf

Keywords: Researchers, Scientists

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Full Text: 1990\Scientist4, 1.pdf

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Full Text: 1990\Scientist4, 20.pdf

Keywords: Researchers, Scientists

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Full Text: 1990\Scientist4, 14.pdf

Keywords: Citation, Scientists

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Full Text: 1990\Scientist4, 18.pdf

Keywords: Researchers, Scientists

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Full Text: 1994\Scientist8, 3.pdf

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Full Text: 1994\Scientist8, 15.pdf

Abstract: Organic chemistry’s top-cited papers: The newsletter science watch recently examined the most-referenced papers in organic chemistry, a subdiscipline that employs a substantial number of research chemists.

Keywords: Research

? Moore, P.D. (1994), Oceanic plants are at the root of ecologys most-cited studies (Reprinted from Science-Watch, June, 1994). *Scientist*, **8** (23), 15.

Full Text: 1994\Scientist8, 15.pdf

Abstract: Biological oceanography led a recent study of the citation records of ecology and environmental sciences articles, reported in the newsletter Science Watch.

Keywords: Citation, Environmental, Environmental Sciences, Oceanography, Science, Sciences

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Full Text: 1995\Scientist9, 13.pdf

Abstract: Last year’s most cited authors and “hottest” topics were identified through citation analysis in a recent issue of the newsletter Science Watch, reprinted here.

Keywords: Analysis, Authors, Citation, Citation Analysis, Science, Topics

? (1996), Most-cited research articles, top ‘hot paper’ authors of 1995. *Scientist*, **10** (11), 13-??.

Abstract: What’s Hot, Who’s Hot: The hottest scientists of 1995 as well as last year’s hottest papers were identified in a recent article in the newsletter Science Watch, reprinted here.

Keywords: Articles, Research, Science

Garfield, E. (1997), Dispelling a few common myths about journal citation impacts. *Scientist*, **11** (3), 11.

Full Text: [S\Scientist11, 11.pdf](S/Scientist11,%2011.pdf)

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Full Text: 1997\Scientist11, 10.pdf

Abstract: THE hottest of ‘96: Last year’s most-cited research articles and the authors who have fielded the most “hot” papers are identified in a report from the newsletter Science Watch, reprinted here.

Keywords: Authors, Papers, Research, Science

Garfield, E. (1998), Long-Term vs. Short-Term Journal Impact: Does it matter? *Scientist*, **12** (3), 10.

Full Text: [S\Scientist12, 10.pdf](S/Scientist12,%2010.pdf)

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Full Text: [S\Scientist12, 12.pdf](S/Scientist12,%2012.pdf)

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Full Text: [1999\Scientist13, 12.pdf](1999/Scientist13,%2012.pdf)

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Full Text: [2000\Scientist14, 4-1.pdf](2000/Scientist14,%204-1.pdf)

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Full Text: [2000\Scientist14, 6.pdf](2000/Scientist14,%206.pdf)

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Full Text: [2000\Scientist14, 4.pdf](2000/Scientist14,%204.pdf)

Keywords: Scientific Discovery

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Full Text: [2002\Scientist16, 6.pdf](2002/Scientist16,%206.pdf)

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Full Text: [2002\Scientist16, 10.pdf](2002/Scientist16,%2010.pdf)

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Full Text: [2005\Scientist19, 24.pdf](2005/Scientist19,%2024.pdf)

Keywords: h Index, h-Index

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Full Text: [2006\Scientist20, 15.pdf](2006/Scientist20,%2015.pdf)

Keywords: h Index, h-Index

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Full Text: [2006\Scientist20, 14.pdf](2006/Scientist20,%2014.pdf)

Keywords: h Index, h-Index

? Wiley, S. (2009), Don’t fight to be cited forget science and cell: Submit your papers to the journals read by your grant reviewers. *Scientist*, **23** (1), 25.

Full Text: 2009\Scientist23, 25.pdf

Keywords: Journals, Papers

? Wachtel, M. (2010), Retracted: Highly Cited Paper. *Scientist*, **24** (6), 19.

Full Text: 2010\Scientist24, 19.pdf

# Title: Scientometrics

Full Journal Title: [Scientometrics](http://www.springerlink.com/content/1588-2861/), [Scientometrics](http://www.ingentaconnect.com/content/klu/scie)

ISO Abbreviated Title: Scientometrfics

JCR Abbreviated Title: Scientometrics

ISSN: 0138-9130

Issues/Year: 12

Journal Country Netherlands

Language: English

Publisher: Kluwer Academic Publ

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? de Solla Price, D. (1978), Editorial statements. *Scientometrics*, **1** (1), 3-8.

Full Text: [1960-80\Scientometrics1, 3.pdf](1960-80/Scientometrics1,%203.pdf)

? Gilbert, G.N. (1978), Measuring the growth of science: A review of indicators of scientific growth. *Scientometrics*, **1** (1), 9-34.

Full Text: [1960-80\Scientometrics1, 9.pdf](1960-80/Scientometrics1,%209.pdf)

Abstract: A number of indicators of the growth of science are critically reviewed to asses their strengths and weaknesses. The focus is on the problems involved in measuring two aspects of scientific growth, growth in manpower and growth in knowledge. It is shown that the design of better indicators depends on careful consideration of the theoretical framework within which the indicators are intended to be used. Recent advances in the sociology of science suggest ways in which the validity of existing indicators may be assessed and improved. This paper is a revision of one presented to the International Symposium on Quantitative Methods in the History of Science, Berkely, California, August 25–27, 1976, under the title Measuring Science.

? Narin, F. (1978), Objectivity versus relevance in studies of scientific advance. *Scientometrics*, **1** (1), 35-41.

Full Text: [1960-80\Scientometrics1, 35.pdf](1960-80/Scientometrics1,%2035.pdf)

Abstract: A conceptual framework is suggested within which various techniques for studying scientific advance may be viewed. The two axes are *relevance* of the technique to a ‘true’ measure of the rate of scientific advance, versus *objectivity* of the technique. It is suggested that a situation exists somewhat analogous to the Heisenberg uncertainty principle, the most objective technique, a simple publication count, is the least relevant to a true measure of scientific advance, while the most relevant technique, interviews with an eminent and knowledgeable scientist in the field, is the least objective. Between these two extremes lie a group of scientometric techniques which should be capable of producing analyses which are both satisfactorily relevant and satisfactorily objective.

? Inhaber, H. and Alvo, M. (1978), World science as an input-output system. *Scientometrics*, **1** (1), 43-64.

Full Text: [1960-80\Scientometrics1, 43.pdf](1960-80/Scientometrics1,%2043.pdf)

Abstract: World science can be characterized as the product of one scientist or nation — knowledge or published papers — used or consumed by other scientists or nations. In this sense, science can be viewed as an input-output system, analogous to the models used in economics. An input-output model of the citation patters of the 18 leading countries in international science was constructed. These countries produce most of the world’s science. The large role of the United States in both producing and consuming scientific information is evident in the results. The models also show the role of other countries with respect to each other. For example, the multinational nature of science in countries like the Netherlands and Switzerland is evident. The model can be used to show which countries interact with others, and which do not. Both types of information are useful in discussing trans-national interactions in science.

? deB Beaver, D. and Rosen, R. (1978), Studies in scientific collaboration. 1. Professional origins of scientific co-authorship. *Scientometrics*, **1** (1), 65-84.

Full Text: [1960-80\Scientometrics1, 65.pdf](1960-80/Scientometrics1,%2065.pdf)

Abstract: From a historical and sociological perspective, this essay presents and develops the first comprehensive theory of scientific collaboration: collaborative Scientific research, formally acknowledged by co-authorships of scientific papers, originated, developed, and continues to be practiced as a response to the professionalization of science. Following an overview of the origins and early history of collaboration in the 17th and 18th centuries, a.study of the first professionalized scientific eommunity~ that of Napoleonic France, confirms that, as the theory predicts, collaboration is atypical research style associated with professionalization. In the early 19th century, virtually all joint research was performed by French scientists, collaborative research only appeared much later in England and Germany when they, too, underwent professionalization. That historical finding, which constitutes a puzzling anomaly for any other view of scientific teamwork, here conforms to theoretical expectation. Several other predictions of the theory are presented, to be taken up in subsequent studies.

? Hustopecký, J. and Vlachý, J. (1978), Identifying a set of inequality measures for science studies. *Scientometrics*, **1** (1), 85-98.

Full Text: [1960-80\Scientometrics1, 85.pdf](1960-80/Scientometrics1,%2085.pdf)

Abstract: Indices of inequality are tested against skewed frequency distributions met in science studies by the method of principal component analysis. The procedure holds some promise of providing a limited set of measures which can help to differentiate populations within several different substantive contexts. Variation of six selected measures of inequality with mean for the cases of four simple probability distributions is demonstrated.

? Vlachý, J. (1978), Research, technology and innovation policy in the Frg, 1951-1977 - Weber, G. *Scientometrics*, **1** (1), 99-100.

Full Text: [1960-80\Scientometrics1, 99.pdf](1960-80/Scientometrics1,%2099.pdf)

? Polacek, V. (1978), Bibliography of biology - Analytical presentation with respect to the history of science and to information-theory - German - Simon, HR. *Scientometrics*, **1** (1), 100.

Full Text: [1960-80\Scientometrics1, 100.pdf](1960-80/Scientometrics1,%20100.pdf)

? Vlachý, J. (1978), Frequency distributions of scientific performance a bibliography of Lotka’s law and related phenomena. *Scientometrics*, **1** (1), 107-130.

Full Text: [1960-80\Scientometrics1, 107.pdf](1960-80/Scientometrics1,%20107.pdf)

? deB Beaver, D. and Rosen, R. (1979), Studies in scientific collaboration. 2. Scientific co-authorship, research productivity and visibility in the French scientific Elite, 1799-1830. *Scientometrics*, **1** (2), 133-149.

Full Text: [1960-80\Scientometrics1, 133.pdf](1960-80/Scientometrics1,%20133.pdf)

Abstract: This essay investigates a number of the predictions of the theoretical view of scientific collaboration as a response to the professionalization of science: (1) that collaboration is most typically practiced by the scientific elite, or those who aspire to it, (2) that it increases individual research productivity, and (3) that it enhances the visibility of research to the largcr scientific community. With respect to the first professionalized scientific community, that of Napoleonic France, the study focusses on the research practices and careers of mcmbcrs of the Society of Arceuil, the Philomatic Society, and the First Class oi the Institut, as they illustrate and confirm the accuracy of those predictions.

? Boalt, G. and Bergryd, U. (1979), Differences in research orientation reflected in the allocation of grants - Methodological study. *Scientometrics*, **1** (2), 151-159.

Full Text: [1960-80\Scientometrics1, 151.pdf](1960-80/Scientometrics1,%20151.pdf)

Abstract: The scientists in the Social Science Research Councils are, after all, human and their own research orientation will influence their attitude towards applicants and project. But their attitude will be strengthened or counteracted by other factors. They may be conscious of their bias and try to compensate for it eitaer because they really want to be fair or because they are afraid to appear biassed in the eyes of the other council members. And then other personal factors may affect their decision: friendship with the applicants, their wish to repay a former member of the council for grants they once received from him or their striving for their own personal research empire. Each such factor will influence grant allocation in a special way. The necpositivistic sociologist in the Swedish Social Science Research Council was in 1973 relieved by a more radical sociologist and we have used this opportunity to see whether it is possible to study the effect of the changed research orientation, although other person factors will influence grant allocation. We worked Out alternative hypothesis systems built on a) research orientation and b) personal research empire building. Our methodmade sense in this particular case and should be possible to use under similar conditions.

? Moravcsik, M.J. and Murugesan, P. (1979), Citation patterns in scientific revolutions. *Scientometrics*, **1** (2), 161-169.

Full Text: [1960-80\Scientometrics1, 161.pdf](1960-80/Scientometrics1,%20161.pdf)

Abstract: The method of classifying citations according to the context in the citing paper, previously developed by the authors, is applied to the study of scientific revolutions. In particular, the BCS theory of superconductivity and the non-conservation of parity are investigated. The results can be easily interpreted in terms of the characteristic features of these discoveries. It is suggested that these two examples represent two different types of ‘paradigm’ changes, thus prompting a considerable refinement of the usual dichotomous picture of ‘normal’ *vs.* ‘breakthrough’ science.

? Chubin, D.E. and Studer, K.E. (1979), Knowledge and structures of scientific growth: Measurement of a cancer problem domain. *Scientometrics*, **1** (2), 171-193

Full Text: [1960-80\Scientometrics1, 171.pdf](1960-80/Scientometrics1,%20171.pdf)

Abstract: In the context of bridging the so-called externalist and cognitive perspectives on the growth of research communities, a cancer ‘problem domain’ is examined (1) to distinguish a growth in knowledge from a proliferating research literature, and (2) show how measurement of formal communiation, uninformed by the ‘historical record,’ clarifies or distorts sociological interpretations of innovation and growth in biomedicine. Specifically, coauthorship and citation networks are analyzed for reverse transcriptase researchers, 1970-74. This analysis reveals the visibility of large National Cancer Institute laboratories in the research literature, but demonstrates the need to augment disaggregated network data with intellectual and social (policy) history to explain the growth and structure of the domain.

? Bláha, K. (1979), Essays of An Information Scientist - Garfield, E. *Scientometrics*, **1** (2), 195-196.

Full Text: [1960-80\Scientometrics1, 195.pdf](1960-80/Scientometrics1,%20195.pdf)

? Hustopecký, J. (1979), Urn models and their application - Johnson, NL, Kotz, S. *Scientometrics*, **1** (2), 196.

Full Text: [1960-80\Scientometrics1, 196.pdf](1960-80/Scientometrics1,%20196.pdf)

? Vlachý, J. (1979), Mobility in science: Bibliography of scientific career migration, field mobility, international academic circulation and brain-drain. *Scientometrics*, **1** (2), 201-228.

Full Text: [1960-80\Scientometrics1, 201.pdf](1960-80/Scientometrics1,%20201.pdf)

? deB Beaver, D. and Rosen, R. (1979), Studies in scientific collaboration. 3. Professionalization and the natural-history of modern scientific co-authorship. *Scientometrics*, **1** (3), 231-245.

Full Text: [1960-80\Scientometrics1, 231.pdf](1960-80/Scientometrics1,%20231.pdf)

Abstract: A review of selected parameters of the growth of scientific collaboration over the last century provides further confirmation of the dependency of teamwork on the increasing professionalization of science. Analysis reveals significant inaccuracies in current views of the recency and prevalence of collaborative research, and affords a more correct picture of twentieth century developments. A change in the growth rate of the practice of scientific collaboration at about the time of World War I, and indications of associations of teamwork with financial support and research publication in leading journals are discussed. Characteristics of the natural history of scientific coUaboration ~ signify that collaboration reflects relationships of dependency within a hierarchically stratified professional community, and serves as a means of professional mobility. As such, it continues to fulfil its original functions.

? Szalai, A. (1979), Research on research and some problems of research bureaucracy. *Scientometrics*, **1** (3), 247-260

Full Text: [1960-80\Scientometrics1, 247.pdf](1960-80/Scientometrics1,%20247.pdf)

Abstract: The paper deals in its first part critically with the ‘*ideo-eentric*’interpretation of the subject matter of the sociology of science. Especially American sociologists tend to regard sociology of science as a *part* of the sociology of knowledge, specialized in defining the nature of scientific *ideas* and their relations to other kinds of ideas, institutional and personality factors, etc. However, in our days the center of gravity of sociological studies on science has shifted more and more outward of the domain of the sociology of knowledge. *Research on research,* particularly research on the objective socio-economic, organizational and operational aspects of institutionalized and professionalized research activity, have become very central to the sociology of science and have made probably some of the greatest contributions to its recent development. The material demands of society on science, and vice versa, the investment of society in the scientific establishment, the bread-and-board questions of research activity, the hard realities of national and industrial research policies, etc., provide a vast *terra incognita* into which the contemporary sociology of science must foray. The second part of the present paper deals with the delineation of a stretch of the ‘unknown land’ that has remained hitherto largely unexplored by the sociology of science, namely with the structure and the functions of contemporary *research bureaucracy.* Some findings of a Hungarian empirical study are discussed which seem to indicate that ‘big science’ tends to go hand in hand with big research bureaucracy, in particular with an increased share of administrative personnel in the total staff on research institutions.

? Rabkin, Y.M. and Inhaber, H. (1979), Science on the periphery: Citation study of 3 less developed-countries. *Scientometrics*, **1** (3), 261-274.

Full Text: [1960-80\Scientometrics1, 261.pdf](1960-80/Scientometrics1,%20261.pdf)

Abstract: The scientific interactions of three peripheral nations in terms of citations and references to scientific literature is considered. The nations chosen are Argentina, Brazil and Norway, each with scientific establishments much smaller than those of central, or major, scientific nations. These three nations cite publications of the central nations strongly in comparison to those of theiI own country. Of the citations to the publications of these three countries, the bulk are generated from within the country involved. There is comparatively little interaction with neighbours. Further work is needed to determine if these patterns exist for most peripheral countries.

? Kunz, M. (1979), Time distribution of patent information. *Scientometrics*, **1** (3), 275-282.

Full Text: [1960-80\Scientometrics1, 275.pdf](1960-80/Scientometrics1,%20275.pdf)

Abstract: Abandonement rates of patents in five European countries are studied. The time distribution of British patents can be described by a truncated Gauss’ distribution Belgian patents by a Poisson’s distribution. Appropriate models derived on the base of the octogonal and cubical linear vector space norms are discussed.

? Vlachý, J. (1979), Physics careers, employment and education - Perl, ML. *Scientometrics*, **1** (3), 283-284.

Full Text: [1960-80\Scientometrics1, 283.pdf](1960-80/Scientometrics1,%20283.pdf)

? Vlachý, J. (1979), Nobel-Prizes: Bibliography of scientometric papers and data sources. *Scientometrics*, **1** (3), 295-301.

Full Text: [1960-80\Scientometrics1, 295.pdf](1960-80/Scientometrics1,%20295.pdf)

? Mulchenko, Z.M., Granovsky, Yu.V. and Strakhov, A.B. (1979), On scientometrical characteristics on information activities of leading scientists. *Scientometrics*, **1** (4), 307-325.

Full Text: [1960-80\Scientometrics1, 307.pdf](1960-80/Scientometrics1,%20307.pdf)

Abstract: A comparative analysis of the information activities of leading scientists has been carried out, including 5 Soviet chemists and 5 foreign ones, and 8 Soviet physicists, specialist in low temperature physics. Within chemists there has appeared a tendency to a new form of scientific activities, namely ephemeron teams which favour the ‘production line’ mode of getting new information. In physics, the traditional scheme is preserved: leading scientists publish few articles and have few co-authors. The ephemeron teams produce an expanding information: new objects and processes are studied from the previously elaborated point of view. The specific average citation rate (number of references per number of papers) is a criterion for separating the publications of the ‘intellectual industry’ from the pilot studies full of novel ideas.

? Rabkin, Y.M. and Lafittehoussat, J.J. (1979), Cooperative research in petroleum chemistry. *Scientometrics*, **1** (4), 327-338.

Full Text: [1960-80\Scientometrics1, 327.pdf](1960-80/Scientometrics1,%20327.pdf)

Abstract: The American Petroleum Institute (All) Research Project 6 has been chosen as a model to study the science organization in petroleum chemistry. The quantitative analysis of scientific publications, references, citations and citation lags elucidates the cooperative nature of Project 6.

? Brožek, V. and Karen, P. (1979), Dynamics of information-flow in the field of rare-earth carbides research. *Scientometrics*, **1** (4), 339-357.

Full Text: [1960-80\Scientometrics1, 339.pdf](1960-80/Scientometrics1,%20339.pdf)

Abstract: Dynamics of the research of rare earth carbide compounds are analysed by the information flow method. Papers concerning the matter indicated in the *ChemicalAbstracts* as well as in surveys of professional literature since 1895 are categorised into a three-dimensional system of 29 descriptors, according to their date of publication. A new, finer unit of scientific production volume is used for the information flow quantification. Selected complete time arrays are approximated using either an exponential curve and the Gompertz function, the growth constants for the time array are also calculated. Development until 1975 is estimated on the basis on the course of the approximated arrays up to 1973 and is compared with the actual state.

? Garfield, E. (1979), Is citation analysis a legitimate evaluation tool? *Scientometrics*, **1** (4), 359-375.

Full Text: [1960-80\Scientometrics1, 359.pdf](1960-80/Scientometrics1,%20359.pdf)

Abstract: A comprehensive discussion on the use of citation analysis to rate scientific performance and the controversy surrounding it. The general adverse criticism that citation counts include an excessive number of negative citations (citations to incorrect results worthy of attack), self-citations (citations to the works of the citing authors), and citations to methodological papers is analyzed. Included are a discussion of measurement problems such as counting citations for multiauthored papers, distinguishing between more than one person with the same last name (homographs), and what it is that citation analysis actually measures. It is concluded that as the scientific enterprise becomes larger and more complex, and its role in society more critical, it will become more difficult, expensive and necessary to evaluate and identify the largest contributors. When properly used, citation analysis can introduce a useful measure of objectivity into the evaluation process at relatively low financial cost.

? Vlachý, J. (1979), Quotations and scientometrics. *Scientometrics*, **1** (4), 377-380.

Full Text: [1960-80\Scientometrics1, 377.pdf](1960-80/Scientometrics1,%20377.pdf)

? Dobrov, G.M., Randolph, R.H. and Rauch, W.D. (1979), New options for team research via international computer-networks. *Scientometrics*, **1** (5-6), 387-404.

Full Text: [1960-80\Scientometrics1, 387.pdf](1960-80/Scientometrics1,%20387.pdf)

Abstract: In this paper, international team research (ITR) is discussed as an object for measurement, systems analysis, and management. The paper is intended as a contribution to the development of a ‘problem’ orientation in scientometrics. In the authors’ view, scient-9- metric studies can help solve the problem of efficient ITR in several ways - for instance, by identifying needed improvements in (a) international ~scientific communication in general, (b) scientific interactions within and among research teams as part of the creative process, and (c) the overall international usage of existing scientific knowledge. The paper discusses the machinery of ITR, models of scientific communication, and some original experience in using computers and telecommunications as tools for scientific interaction. All of these are potential objects for scientometric investigation. The paper itself performs some first steps in obtaining economic parameters for the different forms of international team research.

? Inhaber, H. and Lipsett, M.S. (1979), Gaps in ‘gaps in technology’ and other innovation inventories. *Scientometrics*, **1** (5-6), 405-417.

Full Text: [1960-80\Scientometrics1, 405.pdf](1960-80/Scientometrics1,%20405.pdf)

Abstract: A 1970 report of the Organization for Economic Corporation and Development indicated that Canada ranked last on a list of about 10 industrialized countries in terms of innovations. This ranking has been used to support frequently held contention that Canada is technologically uninnovative. However, the OECD list had no criteria for the inclusion or exclusion of a particular innovation. The OECD data has areas of difference with other independent measures of innovation. A comparison is made to a related study by Gellman Associates. This latter study shows that the Canadian position is not as poor as indicated by the OECD list.

? Krauze, T.K. and Mcginnis, R. (1979), Matrix analysis of scientific specialties and careers in science. *Scientometrics*, **1** (5-6), 419-444.

Full Text: [1960-80\Scientometrics1, 419.pdf](1960-80/Scientometrics1,%20419.pdf)

Abstract: A preliminary theoretical study is given of scientometric parameters such as co-authorship, co-references, co-citation, etc. The concept is based on a ‘scientific space’ whose elements are the scientific articles and their authors. The matrix operations representing certain hypotheses as well as sound definitions of concepts used so far in scientometrics are discussed.

? Small, H.G. and Crane, D. (1979), Specialties and disciplines in science and social-science - Examination of their structure using citation indexes. *Scientometrics*, **1** (5-6), 445-461.

Full Text: [1960-80\Scientometrics1, 445.pdf](1960-80/Scientometrics1,%20445.pdf)

Abstract: The technique of co-citation cluster analysis is applied to a special three-year (1972-1974) file of the *Social Sciences Citation Index.* An algorithm is devised for identifying clusters which belong to a discipline based on the percentage of source documents which appear in a disciplinary journal set. Clusters in three disciplines (economics, sociology and psychology) are identified using this algorithm. Clusters in a specialty of natural science (particle physics) obtained from the 1973 *Science Citation Index are* compared and contrasted with the three groups of social sciences clusters. Certain common structural characteristics of the social science and natural science groups suggest that knowledge is developing in parts of the social science disciplines in a manner similar to the natural sciences

? Shearer, E. and Moravcsik, M.J. (1979), Citation patterns in little science and big science. *Scientometrics*, **1** (5-6), 463-474.

Full Text: [1960-80\Scientometrics1, 463.pdf](1960-80/Scientometrics1,%20463.pdf)

Abstract: The classification of citations by their context, previously formulated and used for other studies, is employed here to see if the citation patterns of big and little science are different or not. Theoretical physics articles in 1935 and 1955 are thus compared. No significant differences were found except in the number of references per article which increased significantly from 1935 to 1955, and again to 1968. It is found, however, that the German journal Zeitschrift für Physik has considerably higher percentages of conceptual, organic, and evolutionary citations, both in 1935 and in 1955, than The Physical Review. The interpretation of this difference remains unclear.

? Yablonsky, A.I. (1980), Fundamental regularities of the distribution of scientific productivity. *Scientometrics*, **2** (1), 3-34.

Full Text: [1960-80\Scientometrics2, 3.pdf](1960-80/Scientometrics2,%203.pdf)

Abstract: This paper presents a methodological and mathematical study of the main regularities related to the distribution of scientific productivity. An analysis of these regularities is given from the point of view of two approaches, the frequency and the rank approaches, to the problem of scientific productivity. The connection between these approaches is studied and a number of mathematical formulas that are both of theoretical significance for the understanding of information data basis formation mechanisms and of practical one, in particular, for the estimate of Bradford’s law parameters, are deduced. The relation between the scientific productivity distributions under consideration and the stable non-Gaussian distributions is analyzed. The formation of the corresponding regularities of scientific productivity is regarded as a consequence of probability process combined with deterministic one.

? Cohen, J.E. (1980), Publication rate as a function of laboratory size in a biomedical-research institution. *Scientometrics*, **2** (1), 35-52.

Full Text: [1960-80\Scientometrics2, 35.pdf](1960-80/Scientometrics2,%2035.pdf)

Abstract: At the Rockefeller University in 1977-78, the number of aU publications of a research group in a year was approximately proportional to the number of individuals in that group during the year. The number of primary research publications of a group in a year was also approximately proportional to the number of individuals in that group during the year. The observed frequency distribution of laboratory size was statistically indistinguishable from a 0-truncated negative binomial distribution, which is the equilibrium frequency distribution of size predicted by stochastic models for the dynamics of freely-forming primate social groups.

? Carpenter, M.P. and Narin, F. (1980), Subject composition of the worlds scientific journals. *Scientometrics*, **2** (1), 53-63

Full Text: [1960-80\Scientometrics2, 53.pdf](1960-80/Scientometrics2,%2053.pdf)

Abstract: A country by subject count of the serial periodical collection at the British Library Lending Division (BLLD) in 1973 is reported and compared to previous counts. Approximately 25 000 periodicals have titles indicating that they are scientific journals in nine fields of the physical and biological sciences, engineering, and mathematics. The overall subject distribution of the journals appears to be remarkably stable when compared to a similar count by *Hulme* 60 years ago, although the number of journals appears to have doubled in the last 60 years. A major shift was found in the national origin of the journals, when compared with *Hulme’s* counts, with a notable rise in the number and percent of U.S. journals, and a sharp decline in the percentage of French and German journals.

? Haitun, S.D. (1980), Scientometric investigations in the USSR. *Scientometrics*, **2** (1), 65-84.

Full Text: [1960-80\Scientometrics2, 65.pdf](1960-80/Scientometrics2,%2065.pdf)

Abstract: The following is a review of scientometric investigations in the USSR. Scientometrics has been taken in the rigorous sense of the term, defined as an approach of the science of science which attempts to measure science*reproducibly*. The state of scientometric research in the Soviet Union is compared to that of other countries.

? Chubin, D. (1980), Is citation analysis a legitimate evaluation tool. *Scientometrics*, **2** (1), 91-92.

Full Text: [1960-80\Scientometrics2, 91.pdf](1960-80/Scientometrics2,%2091.pdf)

? Garfield, E. (1980), Is citation analysis a legitimate evaluation tool - Reply. *Scientometrics*, **2** (1), 92-94.

Full Text: [1960-80\Scientometrics2, 92.pdf](1960-80/Scientometrics2,%2092.pdf)

? Knorr, K.D. and Mittermeir, R. (1980), Publication productivity and professional position: Cross-national evidence on the role of organizations. *Scientometrics*, **2** (2), 95-120.

Full Text: [1960-80\Scientometrics2, 95.pdf](1960-80/Scientometrics2,%2095.pdf)

Abstract: Studies of stratification in science have increasingly accepted the idea that science is a highly stratified and elitist system with skewed distributions of productivity and rewards. Attempts to explain the higher productivity of higher status scientists by pointing to their greater ease of publication as far as acceptance of their work by journals and publishers is concerned were not supported by the data in some recent studies. If status in general does not confer greater ease of publication the present paper argues that position within a research organization does confer greater ease of author - or co-authorship - and this is the major explanatory variable accounting for productivity differences within l’esearch laboratories as far as quantity of articles (and books) is concerned. Upward moves in a laboratory’s formal or informal position hierarchy are associated with a change of a scientist’s research involvement from goal executing to goal setting functions as well as with an increasing access to scientific manpower and project money. Goal setting tasks provide for a significant reduction of time-expenditures in research necessary to assure that the scientist is identified with the research results, consequently, they allow for an involvement in more research tasks than originally. Equivalently, resources in scientific manpower and project money act as a, multiplying element as far as quantity of output is concerned.

? Pokrovsky, V.A. (1980), Some problems of measuring the impact of R and D upon the efficiency of social production. *Scientometrics*, **2** (2), 121-132.

Full Text: [1960-80\Scientometrics2, 121.pdf](1960-80/Scientometrics2,%20121.pdf)

Abstract: A cxitical analysis of works by Soviet authors, devoted to the problem of assessing the contribution of science to the efficiency of social production, is carried out. The computational results of two different versions of production function and a factor analysis technique are also presented, based on the same statistical data of the 8th and the 9th Five- Yeax-Plan periods. The numerical value of economic efficiency of investment in R & D, which was determined by relating the benefits from R & D to the associated expenditures, has been found to be 2.1-11 times higher than the profitability of plant investment. The classification and analysis of the major factors, contributing to the growth of public production efficiency, using a multiple correlation technique, show, that a 1% increase in R & D expenditures is associated with a 0.43% rise in labor productivity which also confirms the higher productivity of R & D investments.

? Frame, J.D. (1980), Measuring scientific activity in lesser developed-countries. *Scientometrics*, **2** (2), 133-145.

Full Text: [1960-80\Scientometrics2, 133.pdf](1960-80/Scientometrics2,%20133.pdf)

Abstract: Quantitative indicators of scientific and technological activity are often of questionable validity and reliability. This is particularly true in lesser developed countries, where the lack of data gathering skills may frequently result in the development of misleading indicators. A number of manpower, education, expenditure, and publication indicators are examined for thirteen Middle Eastern countries. Reliability and validity problems are discussed for each indicator. The indicators are found to correlate with each other in reasonable ways, suggesting that despite their possible flaws, they nonetheless appear to measure scientific activity with some consistency.

? Sheldon, J.C. (1980), Cybernetic theory of physical science professions - causes of periodic normal and revolutionary science between 1000 and 1870AD. *Scientometrics*, **2** (2), 147-167.

Full Text: [1960-80\Scientometrics2, 147.pdf](1960-80/Scientometrics2,%20147.pdf)

Abstract: The changing levels of activities in a physical science profession are modelled as a network of relations between different career stages. This cybernetic theory predicts that the dominance of elites undergoes 300 year cycles of sharp alternations whereas the challenge of embryonic elites fluctuates in 100 year cycles. These results seem confirmed by a survey of chemical histories: the birthrate of outstanding chemists oscillates in 300 year cycles and of lesser chemists in 100 year cycles, both with the waveproffle specified by the model. These fluctuations seem to correspond to *Kuhn’s* periods of revolutionary and normal science.

Notes: UUniversity

? Le Pair, C. (1980), Switching between academic disciplines in universities in the Netherlands. *Scientometrics*, **2** (3), 177-191.

Full Text: [1960-80\Scientometrics2, 177.pdf](1960-80/Scientometrics2,%20177.pdf)

Abstract: The Netherlands university system encompasses roughly one half of the state financedresearch enterprise. Some characteristics and data on the field of education and present occupation of the professional staff in this system are given and conclusions are drawn concerning field mobility and mutual influencing of different disciplines.

Keywords: The Netherlands

? Gordon, M.D. (1980), A critical reassessment of inferred relations between multiple authorship, scientific collaboration, the production of papers and their acceptance for publication. *Scientometrics*, **2** (3), 193-201.

Full Text: [1960-80\Scientometrics2, 193.pdf](1960-80/Scientometrics2,%20193.pdf)

Abstract: There have recently been completed a number of studies which analyse and interpret trends in multiple authorship for scientific papers. This paper presents data which show that a significant relationship exists between levels of multiple authorship for papers submitted to a leading Astronomy journal, and their frequency of acceptance for publication. It is argued that this finding indicates the need for the exercise of more extensive qualification when drawing inferences about actual social aspects of research activity, from trends in the multiple authorship of published papers.

? Bonitz, M. (1980), Evidence for the invalidity of the Bradford Law for the single scientist. *Scientometrics*, **2** (3), 203-214.

Full Text: [1960-80\Scientometrics2, 203.pdf](1960-80/Scientometrics2,%20203.pdf)

Abstract: On the basis of a previously proposed method using meta-informations accumulating during SDI from an international system of the INIS-type, it is investigated, how the scientific journal rank distribution of a research institution, for which the Bradford law is valid, is composed of the single scientists’ journal distributions. In this transition from a macroscopic into a microscopic field of scientific communication evidence was found for the invalidity of the Bradford law for the journal rank distribution of a single scientist. This effect seems to confirm a fundamental qualitative difference of both fields of scientific communication.

? Lyon, W.S. (1980), Organization, attendance, speakers, and sessions: A study of 4 scientific conference series. *Scientometrics*, **2** (3), 215-226.

Full Text: [1960-80\Scientometrics2, 215.pdf](1960-80/Scientometrics2,%20215.pdf)

Abstract: An International Atomic Energy Agency (IAEA) Conference series on neutron activation analysis (NAA) in life sciences has been compared to another IAEA conference series and to two other conference series. No great differences in multiple attendees, speakers, chairmen, or diversity of session subjects was seen. The NAA meetings do appear to be less forrealized than the others.

Note: TTopic

? Lawson, J., Kostrewski, B. and Oppenheim, C. (1980), A bibliometric study on a new subject field: Energy analysis. *Scientometrics*, **2** (3), 227-237.

Full Text: [1960-80\Scientometrics2, 227.pdf](1960-80/Scientometrics2,%20227.pdf)

Abstract: A bibliometric study on energy analysis literature is reported. The literature is characterised by heavy emphasis on English-language journal articles and reports, and, after an initial exponential growth rate, it is now growing more slowly. Examination of the titles of articles demonstrated that even after ten years there is no standard terminology in the area. This casts doubt on the value of searching by title terms for new interdisciplinary subjects. On the other hand, secondary services employing controlled-language indexing were found to index the articles under a variety of headings. In any case, coverage of the subject by secondary services is generally poor. There are no clear core journals for this subject area. Some recommendations are made on how both authors of papers in the field and secondary services can ensure better retrieval of energy analysis articles.

? Moravcsik, M.J. (1980), Scientific productivity: The effectiveness of research groups in 6 countries - Andrews, FM. *Scientometrics*, **2** (3), 239-240.

Full Text: [1960-80\Scientometrics2, 239.pdf](1960-80/Scientometrics2,%20239.pdf)

? Lyon, W.S. (1980), Communication: The essence of science - Garvey, WD. *Scientometrics*, **2** (3), 241-242.

Full Text: [1960-80\Scientometrics2, 241.pdf](1960-80/Scientometrics2,%20241.pdf)

? Simonton, D.K. (1980), Techno-scientific activity and war: A yearly time-series analysis, 1500–1903 A. D. *Scientometrics*, **2** (4), 251-255.

Full Text: [1960-80\Scientometrics2, 251.pdf](1960-80/Scientometrics2,%20251.pdf)

Abstract: Previous research may have failed to find a general relationship between war and techno-scientific activity due to the failure (a) to treat the various types of war separately and (b) to use yearly rather than generational time series. Hence, the present study examined 404 consecutive years in European civilization from 1500 to 1903. Measures of four distinct kinds of war were defined and a log-transformed measure of techno-scientific activity was derived from a factor analysis of six histories and chronologies. The techno-science measure was regressed on the war measures plus a set of control variables. Techno-scientific activity was found to be a negative function of balance-of-power and defensive wars fought within Europe. In contrast, imperial and civil wars exerted no influence

? Pinski, G. (1980), Citation based measures of research interactivity. *Scientometrics*, **2** (4), 257-263.

Full Text: [1960-80\Scientometrics2, 257.pdf](1960-80/Scientometrics2,%20257.pdf)

Abstract: Citation based measures of research interactivity are derived starting from the array of bibliographic intercitations known as the citation matrix. These measures may be applied to any publishing aggregates such as journals, fields of research or nations and are size normalized, providing size independent measures of interactivity, lnteractivity measures are defined for pairs of units, for a unit within a system and for a system as a whole.

? Dewitt, T.W., Nicholson, R.S. and Wilson, M.K. (1980), Science Citation Index and chemistry. *Scientometrics*, **2** (4), 265-275.

Full Text: [1960-80\Scientometrics2, 265.pdf](1960-80/Scientometrics2,%20265.pdf)

Abstract: Citation data have been collected for a large number of chemists at American universities. The I principal objectives are to examine the use of citations as a tool in the study of sociology of chemical research and to determine the feasibility and accurancy of using automatically generated data. Past results in each of these areas, as well as a projection of future uses of citation data, are presented. First, a pilot study is described and some *tentative* conclusions discussed. *The* method used minimizes some of the most commonlyexpressed criticism of citation data, such as multiple author, self-citations, etc. An effort has been made to establish the accuracy of automatically generated citation data. This project uses as a base for comparison the complete bibliographies of several thousand chemists. Several different’citation indices are compared with other indicators commonly employed in discussions of the characteristics of the field of chemistry. The results generally support the idea that citations are meaningful. However, they also reveal some problems which require that great care be exercised in the use of citation data. The use of citation data to ‘observe’ a chemistry subfield over time also is illustrated.

Keywords: Science Citation Index

? Small, H. and Greenlee, E. (1980), Citation context analysis of a co-citation cluster: Recombinant-DNA. *Scientometrics*, **2** (4), 277-301.

Full Text: [1960-80\Scientometrics2, 277.pdf](1960-80/Scientometrics2,%20277.pdf)

Abstract: The techniques of co-citation clustering and citation context analysis are combined to concretely define the shared knowledge within a research *specialty.* The cluster for a large and fast moving biomedical specialty, recombinant-DNA, is presented in terms of the highly cited documents comprising it and their co-citation links. By examining citation contexts in the papers citing the highly cited documents, it is possible to label each of the documents in the cluster with its specific cognitive meaning for the citing authors. Co-citation contexts are used to reveal the relationships among the concepts symbolized by the highly cited documents, providing a cognitive equivalent of the co-citation links. This may open a new way to the investigation of the logic of conceptual change at the specialty level.

? Manten, A.A. (1980), Publication of scientific-information is not identical with communication. *Scientometrics*, **2** (4), 303-308.

Full Text: [1960-80\Scientometrics2, 303.pdf](1960-80/Scientometrics2,%20303.pdf)

Abstract: Primary papers of international relevance do not always get published in media which have good international dissemination. Samples of literature in animal science, judged by scientists active in that subject field, indicate that this discrepancy may be a truly serious one.

? Sullivan, D., Koester, D., White, D.H. and Kern, R. (1980), Understanding rapid theoretical change in particle physics: A month-by-month co-citation analysis. *Scientometrics*, **2** (4), 309-319.

Full Text: [1960-80\Scientometrics2, 309.pdf](1960-80/Scientometrics2,%20309.pdf)

Abstract: While co-citation analysis has proved a powerful tool in the study of changes in intellectual loci in science, the technique has never been used to study very rapid changes in the theoretical structure of a scientific field. In this paper we present month-by-month co-citation analyses of key phases in the weak-electromagnetic unification research program within particle physics and show that these analyses capture and illuminate very rapid intellectual changes. These data provide yet another illustration of the utility of co-citation analysis for understanding *the* history of *science.*

? Zuckerman, H. and Miller, R.B. (1980), Science indicators - implications for research and policy - Social-Science-Research-Council conference, May 1978. *Scientometrics*, **2** (5-6), 327-330.

Full Text: [1960-80\Scientometrics2, 327.pdf](1960-80/Scientometrics2,%20327.pdf)

? Brooks, H. (1980), Science indicators and science policy. *Scientometrics*, **2** (5-6), 331-337.

Full Text: [1960-80\Scientometrics2, 331.pdf](1960-80/Scientometrics2,%20331.pdf)

Abstract: The relation of science indicators to science policy raises several questions. First is the clef’tuition of the system, whether just academic science or the entire system of technical innovation from research through manufacturing and marketing or government policy and operations. Second is society’s expectations whose realization depends more on political social factors than on sdenee itself. Third is how the output of research can be compared with the imputs into it if there is no norm other than comparative international performance.

Averch, H. (1980), Science indicators and policy analysis. *Scientometrics*, **2** (5-6), 339-345.

Full Text: [1960-80\Scientometrics2, 339.pdf](1960-80/Scientometrics2,%20339.pdf)

Abstract: This paper discusses the use of science indicators by public policy analysts with limited time and resources. Using the example of innovation policy, it describes what kind of policy relevant propositions can be extracted from science indicators and shows the inherent limits of indicators as instruments for policy making. It shows how science indicators can and must be combined with other sources to construct alternative strategies for decision making. It closes with a discussion of the use of science indicators in constructing consistent lines of argument and reasoning for making policy and for checking past policy.

? Zuckerman, H. and Miller, R.B. (1980), Indicators of science: Notes and queries. *Scientometrics*, **2** (5-6), 347-353.

Full Text: [1960-80\Scientometrics2, 347.pdf](1960-80/Scientometrics2,%20347.pdf)

Abstract: Some science indicators can be found in *Social Indicators 1976* as well as *Science Indicators--1976,* but the coverage of science is limited. Neither volume contains data on cognitive aspects of science and technology or on their social consequences. The authors make suggestions for then-and-there assessments of cognitive advance in science and for prospective and retrospective cheeks on the validity of these assessments.

? Mcculloch, R. (1980), International indicators of science and technology: How does the United-States compare? *Scientometrics*, **2** (5-6), 355-367.

Full Text: [1960-80\Scientometrics2, 355.pdf](1960-80/Scientometrics2,%20355.pdf)

Abstract: Because the basic determinants of innovative success are poorly understood, the data in SI-76 cannot support an unambiguous summary assessment of U. S. science. While some nations now rival the U. S. in relative expenditure for R&D, U.S. absolute: expenditure still dwarfs that of any nation except the U. S. S. R., and the U. S. remains preeminent by most measures of technological capacity. However, the technology gap continues to narrow, bringing both costs and benefits to the U.S. Advances abroad threaten the U. S. position in some markets and exacerbate the nation’s trade adjustment problems. But the nation may also benefit substantially from new opportunities to import as well as export advanced technology.

Keywords: United States

? Mansfield, E. (1980), International indicators of science and technology: Comments. *Scientometrics*, **2** (5-6), 369-373.

Full Text: [1960-80\Scientometrics2, 369.pdf](1960-80/Scientometrics2,%20369.pdf)

Abstract: *Science Indicators--1976* has been prepared with a great deal of skill and is a valuable document. The fact that it reflects the unsatisfactory state of basic knowledge of the ways in which science and technology affect, and are affected by, various economic, social, and political variables of interest to policy makers is no fault of its authors. Nonetheless, in handling some topics, the report might have gone further in indicating the limitations of the measures used. Also, several topics omitted from the report might be considered for inclusion in subsequent editions.

? Freeman, R.B. (1980), Indicators of the impact of R and D on the economy. *Scientometrics*, **2** (5-6), 375-385.

Full Text: [1960-80\Scientometrics2, 375.pdf](1960-80/Scientometrics2,%20375.pdf)

Abstract: This paper reviews the literature on the economic effects of R&D and then examines the gaps in our knowledge. While most micro-studies show that R&D raises economic growth, existing knowledge of the mechanisms by which R&D affects productivity and output is sparse, and it is unclear whether the micro-studies can be generalized to the national economy. The paper concludes by examining some possible consequences of the reduced R&D effort by the United States.

? Rosenberg, N. (1980), Indicators of the impact of R and D on the economy: Comments. *Scientometrics*, **2** (5-6), 387-393.

Full Text: [1960-80\Scientometrics2, 387.pdf](1960-80/Scientometrics2,%20387.pdf)

Abstract: These comments assert that the relationships between R&D expenditures and productivity growth are far more complex than they are ordinarily made out to be. R&D expenditures include several very different components, and only a rather small percentage of the total consists of expenditures upon basic science. One should not expect a very close association over time, or among countries, between spending upon R&D and the observed growth in economic productivity.

? Kuh, C.V. (1980), Indicators of scientific manpower. *Scientometrics*, **2** (5-6), 395-403.

Full Text: [1960-80\Scientometrics2, 395.pdf](1960-80/Scientometrics2,%20395.pdf)

Abstract: Although the statistics on science and engineering personnel in *Science Indicators - 1976* can be used to trace changes in the supply and utilization of these personnel, very little is presented that would allow readers to discern the emergence of strengths or weaknesses in this area. The author suggests that the inclusion of a variety of indicators relating to age, quality and mobility of scientific personnel would be a useful addition to the chapter. Additional indicators of labor market change, such as salaries, would also be helpful for policy purposes.

? Cole, S. (1980), Comments on ‘Indicators of scientific manpower’. *Scientometrics*, **2** (5-6), 405-409.

Full Text: [1960-80\Scientometrics2, 405.pdf](1960-80/Scientometrics2,%20405.pdf)

Abstract: In this examination of the implications of the decline in the demand for scientists, research on two questions is discussed. The first is the effect of age upon scientific creativity and the second is the relationship between the number of scientists and the growth of scientific knowledge.

? Ben-David, J. (1980), U. S. science in international perspective. *Scientometrics*, **2** (5-6), 411-421.

Full Text: [1960-80\Scientometrics2, 411.pdf](1960-80/Scientometrics2,%20411.pdf)

Abstract: This is an investigation of the relationship between the institutional structure of American science and its position in world science, as shown by *Science Indicators - 1976.* It concludes that, compared to other countries, the distinct characteristics of American institutions are consistent with, and may actually explain, the leading American position according to the indicators. However recent changes in those institutions may have weakened American science in ways not reflected by the present indicators.

Keywords: United States

? de Solla Price, D. (1980), Comments on ‘U. S. science in an international perspective’. *Scientometrics*, **2** (5-6), 423-428.

Full Text: [1960-80\Scientometrics2, 423.pdf](1960-80/Scientometrics2,%20423.pdf)

Abstract: International data show that the scientific development of the United States is neither better nor worse than expected for its size and industry. Its position is, however, deteriorating rapidly. The postwar expansion in federal funding of research seems to be a response to continued exponential growth rather than a cause. The science indicators volumes, all criticism notwithstanding, are rapidly provoking new understanding of these questions of scientific and technological change.

Keywords: United States

? Bowers, R. (1980), Indicators of basic research in the physical sciences. *Scientometrics*, **2** (5-6), 429-433.

Full Text: [1960-80\Scientometrics2, 429.pdf](1960-80/Scientometrics2,%20429.pdf)

Abstract: Information on basic research in the physical sciences is not readily available in *Science Indicators - 1976,* but it can be synthesized from many chapters of the report. The indicators show that there has been a greater decline in real support by the federal government for the physical sciences than for engineering, the social sciences, or the life sciences. Additional information is needed on the response to this reduction in funding. The author concludes by calling for an accounting of the costs and benefits to basic research of reduced funding and suggests items which should be included in such an accounting.

? Riecken, H.W. (1980), Vital signs for basic research in the behavioral and social sciences. *Scientometrics*, **2** (5-6), 435-437.

Full Text: [1960-80\Scientometrics2, 435.pdf](1960-80/Scientometrics2,%20435.pdf)

Abstract: Notably missing from *Science Indicators* are output measures of the status of basic research in the behavioral and social sciences. Two such measures are suggested. Citation indexes appear to yield estimates of quality as well as productivity that are comparable to peer judgments in various fields of science. A variety of measures of employment of scientific personnel may indicate the growth or decline of scientific activity in specific fields.

? Laporte, T.R. and Chisholm, D. (1980), Indicators of public attitudes toward science and technology. *Scientometrics*, **2** (5-6), 439-448.

Full Text: [1960-80\Scientometrics2, 439.pdf](1960-80/Scientometrics2,%20439.pdf)

Abstract: The use of attitude surveys in *Science Indicators - 1976* is reviewed and found sufficiently flawed to limit the utility of survey results. The primary confusion throughout is the treatment of science and technology as if they were indistinguishable activities. Suggestions for conceptual improvement are presented both for describing attitudes and for predicting changes in them.

? Moravcsik, M.J. (1980), Science and science policy in the Arab world - Zahlan, AB. *Scientometrics*, **2** (5-6), 449-450.

Full Text: [1960-80\Scientometrics2, 449.pdf](1960-80/Scientometrics2,%20449.pdf)

? Heffner, A.G. (1981), Funded research, multiple authorship, and subauthorship collaboration in four disciplines. *Scientometrics*, **3** (1), 5-12.

Full Text: [1981\Scientometrics3, 5.pdf](1981/Scientometrics3,%205.pdf)

Abstract: Increased financial support for science has contributed to a change in the social structure of research, as evidenced by the increase in collaborative research. The present paper examines the relationship between financial support, multiple authorship, and subauthorship in four disciplines. It is shown that financial support for research is associated with an increase in the total number of persons involved in the production of knowledge per journal article. However, the impact of funding is not the same for all modes of collaboration nor the same for all disciplines.

? Marshakova, I.V. (1981), Citation networks in information science. *Scientometrics*, **3** (1), 13-25.

Full Text: [1981\Scientometrics3, 13.pdf](1981/Scientometrics3,%2013.pdf)

Abstract: The method of Co-citation analysis is used to build citation networks in information science. As data base the first 13 volumes (1961 - 1973) of the leading Soviet journal in the field *(Nauchno-tekhnicheskaya Informatsiya)* were used. The results reveal the topical structure of information science, the communities of authors and the names of single leading scientists. The evaluation of scientists’ work is based on two measures: productivity (with or without co-authorship) and popularity (popularity of authors and popularity of papers).

? Leydesdorff, L. and Van Erkelens, H. (1981), Some social-psychological aspects of becoming a physicist. *Scientometrics*, **3** (1), 27-45.

Full Text: [1981\Scientometrics3, 27.pdf](1981/Scientometrics3,%2027.pdf)

Abstract: A group of academic scientists and a group of industrial scientists in the field of solid state physics are compared with regard to their view of ‘the physicist’ in general. In the same way two groups of students in different phases of their training are interviewed in order to get insight into social conflicts present in the educational system. Differences between the groups are found in the importance they attach to the socilal aspect of the research and in the degree to which they feel ‘the physicist’ to be a normative concept.

? de Solla Price, D. (1981), The analysis of scientometric matrices for policy implications. *Scientometrics*, **3** (1), 47-53.

Full Text: [1981\Scientometrics3, 47.pdf](1981/Scientometrics3,%2047.pdf)

Abstract: A method is explained for analysing matrices of statistics where each element should be approximately proportional to some column coefficient and also to some row coefficient. Using U. S. patent data as an example it is shown that entries are usually proportional to country ‘size’ and patent category ‘size’. Deviations from proportionality expectations when tabulated often suggest policy implications.

? de Solla Price, D. (1981), The analysis of square matrices of scientometric transactions. *Scientometrics*, **3** (1), 55-63.

Full Text: [1981\Scientometrics3, 55.pdf](1981/Scientometrics3,%2055.pdf)

Abstract: A method is explained for analysing square matrices of statistics giving transactions between each member of a set of nations, papers, journals, etc. In general self-transactions are different in kind to other exchanges of money, citations, etc., and a special method is given to compute row and column coefficients without relying on the diagonal elements. It is shown that this method yields very satisfactory analyses for journal and national citation data, enabling the members of the set to be assigned measures of size, quality and self-interest and a fuzzy set of clustered members from which all data may be derived.

? Mcallister, P.R. (1981), A guidebook for technology assessment and impact analysis - Porter, AL, Rossini, FA, Carpentier, SR, Roper, AT, Larson, RW, Tiller, JS. *Scientometrics*, **3** (1), 65-66.

Full Text: [1981\Scientometrics3, 65.pdf](1981/Scientometrics3,%2065.pdf)

? Oromaner, M. (1981), Cognitive consensus in recent mainstream American sociology: An empirical analysis. *Scientometrics*, **3** (2), 73-84.

Full Text: [1981\Scientometrics3, 73.pdf](1981/Scientometrics3,%2073.pdf)

Abstract: A number of observers have commented that American sociology has recently experienced a shift in its cognitive structure. In order to empirically investigate these observations, citations in the two most prominent sociological journals during 1955 and 1970 are examined. The data indicate that (a) various theory groups account for a relatively small percentage of authors cited during either period, (b) a number of the earlier theory groups are less prominent than they once were, and (c) there is evidence of the emergence of one new theory group.

? Bindon, G. (1981), Output measures of cooperative research: The case of the pulp and paper research institute of Canada. *Scientometrics*, **3** (2), 85-106.

Full Text: [1981\Scientometrics3, 85.pdf](1981/Scientometrics3,%2085.pdf)

Abstract: Applying various quantitative techniques, this paper attempts to describe and analyze the scientific output of a cooperative industrial research institute (Pulp and Paper Research Institute of Canada, PAPRICAN) by comparing its impact on the employment patterns of McGill graduate students who have done their thesis research under the auspices of the industrial laboratory with graduate students from the same departments who have not worked at PAPRICAN, and a comparison of the publication practices of three groups: PAPRICAN staff not associated with the university (McGilI), the PAPRICAN staff who also hold academic appointments at McGill, and the faculty of the Chemistry Department at McGill who do not hold staff positions at PAPRICAN.

It is found that the academic association with PAPRICAN during graduate research has a significant impact on the number of students who go on to careers in industry. However, close examination of those who remain in Canada indicates that the impact is increasingly felt in only the Pulp and Paper industry. Different ‘macro’ standards are applied to this ‘micro’ example, and policy implications are discussed.

The publication record is again compared to various ‘macro’ standards so as to judge various qualities of the scientific output of the different groups. The PAPRICAN staff performs as would be expected of industrial researchers and the McGill faculty show normal characteristics for an academic group. However, those who holdpositions in both the industrial institute and the academic sector, reveal the special role they play in linking the ‘science’ of the second with the ‘technology’ of the first.

Keywords: Canada

? Malecki, E.J. (1981), A note on the geographical concentration of scientific personnel in the USA. *Scientometrics*, **3** (2), 107-114.

Full Text: [1981\Scientometrics3, 107.pdf](1981/Scientometrics3,%20107.pdf)

Abstract: Theories of urban size and growth have assumed that innovativeness is more common to larger cities. This paper tests the relationship between three measures of scientific employment, and the population of U.S. metropolitan areas. Elasticities of scientific employment with respect to city size and nonlinear functions of city size suggest that innovative ability of the largest urban areas declined somewhat from 1966 to 1972. Diseconomies of size for scientific activity may be becoming dominant in the largest cities in contrast to prevailing assumptions about the advantages of urban size.

Notes: UUniversity

? Frieze, I.H., Knoble, J.M. and Mitroff, I.I. (1981), American university students’ beliefs about success in science: A case study. *Scientometrics*, **3** (2), 115-126.

Full Text: [1981\Scientometrics3, 115.pdf](1981/Scientometrics3,%20115.pdf)

Abstract: Attribution theory as a new perspective for studying the psychology of science and scientists is introduced through use of a case study of college students’ attributions for success and failure in science. The attributional perspective incorporates views of one’s own competence as well as beliefs about the importance of effort for success in science. It also provides a framework for analyzing differences in attitudes about various fields of science. Sex differences in science participation are a further area which can be analyzed from an attributional perspective. Results from the college student study are discussed along with suggestions for future research.

? Chernogorenko, V.B. and Muchnik, S.V. (1981), Scientometric estimation of present-day study on phosphides. *Scientometrics*, **3** (2), 127-134.

Full Text: [1981\Scientometrics3, 127.pdf](1981/Scientometrics3,%20127.pdf)

Abstract: A scientometric analysis of the publications and of the information flow on all phosphides shows that: the bulk of the publications on semieonducting phosphides relates to gallium phosphide. For non-semiconducting phosphides, most of the articles are connected with phosphides of transition metals. Tile bulk of the studies feature crystal structure, phase equilibria, diagrams of state and electrophysical and magnetic properties. Most of the articles on phosphides are published in English (53.4%) and in Russian (24.4%). There is a tendency lbr research to be carried out by groups of researchers of two, three, four or more persons. The present scientometric analysis helps establish the trend of investigations on phosphides.

? Folly, G., Hajtman, B., Nagy, J.I. and Ruff, I. (1981), Some methodological problems in ranking scientists by citation analysis. *Scientometrics*, **3** (2), 135-147.

Full Text: [1981\Scientometrics3, 135.pdf](1981/Scientometrics3,%20135.pdf)

Abstract: A sample of 80 Hungarian scientists, authors or co-authors of a total number of 6273 papers - published between 1930-1976 - has been analysed. Citation data to each *paper* were collected form the 1964-76 SCI’s by manual search. Citation counts were distinguished with respect to the following categories: (I) the set of cited authors has element(s) common with the set of citing authors (self citation), (II) condition I is not satisfied, but the cited author under study and at least one of the citing authors were co-authors prior to the publication of the cited paper, (III) none of the former criteria is satisfied. The yearly average citation frequency of a paper was not corrected for obsolescence, since there is no evidence that the decay of citation frequency with time is independent of the absolute citedness of the paper. Individual performance has been measured (a) by the sum of the yearly average type *111* fractional citation frequencies over all of the author’s papers, (b) by the sum of the yearly average citation frequency normalized to one single-authored paper per year over the period of the author’s activity, (c)- by the same as in a, but summed up only over the most highly cited papers ‘scattering upwards’ from the individual’s own average, (d) by the fractional authorship, and (e) by the number of items in the author’s publication list. The first three parameters seem to be applicable in measuring the utility of the individual’s scientific contribution With slightly different emphasis on different aspects. These parameters are uncorrelated with those measuring the output of individuals.

? Frame, J.D. and Prokrym, D.R. (1981), Counts of U.S. and Soviet science and technology journals. *Scientometrics*, **3** (3), 159-175.

Full Text: [1981\Scientometrics3, 159.pdf](1981/Scientometrics3,%20159.pdf)

Abstract: A detailed examination is made of the 1973 US and Soviet serials holdings of the British Library Lending Division (BLLD), the most comprehensive collection of active scientific and technological serials in the world. In total, 6075 US and 2399 Soviet serials were identified. These serials were then assigned on the basis of their titles to over 200 scientific and technological specialty areas. These assignments clearly show that the US is substantially more active than the USSR in the life sciences and social sciences, while the USSR is relatively more active in the physical and engineering sciences. When comparing the absolute size of the US and Soviet serial counts, it is seen that the US outpublishes the USSR in all major fields (i.e., clinical medicine, biomedical research, biology, chemistry, physics, earth/space science, engineering/technology, mathematics/statistics, psychology, and the social sciences).

Keywords: United States

? Turner, C.F. and Kiesler, S.B. (1981), The impact of basic research in the social sciences: The case of education. *Scientometrics*, **3** (3), 177-190.

Full Text: [1981\Scientometrics3, 177.pdf](1981/Scientometrics3,%20177.pdf)

Abstract: Recent expert evaluations of the condition and funding of educational research in the USA assume that basic research in the social sciences is a~ crucial factor in increasing our understanding and ultimately improving the practice of education (see, for example, the 1977 reporP of the National Academy of Sciences’ Committee on Fundamental Research Relevant to Education), Past tests of this assumption, however, have generally relied upon argument by example or anecdote. In the present study, we analyze citation patterns in the education literature to test the corollary proposition that basic research in the social sciences has had a substantial impact on the literature in education. Empirical data collected on citation patterns in the education literature are found to be largely consistent with this proposition.

? Hubert, J.J. (1981), A rank-frequency model for scientific productivity. *Scientometrics*, **3** (3), 191-202.

Full Text: [1981\Scientometrics3, 191.pdf](1981/Scientometrics3,%20191.pdf)

Abstract: If f(r) is the number of contributions of an author or rank r, then it is shown that f(r) is proportional to r -#, where ~ > 0. The model is dependent on the definitions of ‘a contribution’ and ‘rank’ of an author. Three estimation procedures are illustrated and four other scientific productivity studies, and two data sets on Canadian Mathematicians are shown to adequately fit this rank-frequency relationship.

? Nadel, E. (1981), Citation and co-citation indicators of a phased impact of the BCS theory in the physics of superconductivity. *Scientometrics*, **3** (3), 203-221.

Full Text: [1981\Scientometrics3, 203.pdf](1981/Scientometrics3,%20203.pdf)

Abstract: An intellectual account of of the physics of superconductivity was compared with citation and co-citation daga during two historical periods that coincided wkh the introduction of its central explanatory theory (BCS). Factor analysis is used to investigate the co-citation data. The results give prelh-ninary support to a hypothesis that distinguishes ~pact phases in the effect of the theory on the cognitive organization of the speciaRy. It is also observed that citation and co-citation data are separate types of information which, under scene Mstorical conditions, give diffe~ng resuks.

? Yanovsky, V.I. (1981), Citation analysis significance of scientific journals. *Scientometrics*, **3** (3), 223-233.

Full Text: [1981\Scientometrics3, 223.pdf](1981/Scientometrics3,%20223.pdf)

Abstract: The application of methods of quantitative analysis makes it possible to evaluate the impact of scientific journals on one another. These methods are used to determine the significance of similar scientific journals by their cross-citations, taking into account data from the *Journal Citation Reports (JCR).* They also help to improve the *Journal Citation Reports* structure and widen its uses for the evaluation of scientific journals. The above methods are applied to analyse critically the principles of ranking journals in package 1 and the tabular contents of *JCR’s* packages 2 and 3, as well as to study frequency distributions of the journals both in time and space.

? Shaw, W.M. (1981), Information theory and scientific communication. *Scientometrics*, **3** (3), 235-249.

Full Text: [1981\Scientometrics3, 235.pdf](1981/Scientometrics3,%20235.pdf)

Abstract: Informal and formal communication processes are documented in the primary journal literature. Both processes impose structures on the authors who publish their research, and the formal process imposes a structure on the journals which publish scientific papers. In this paper, it is shown that information theory can he applied to these structures for the purpose of evaluating the contribution that authors and journals make to the communication of scientific information. Experimental results identify the most communicative authors and journals in an area of active research.

? Griffith, B.C. (1981), The scientific journal - Meadows, AJ. *Scientometrics*, **3** (3), 251-252.

Full Text: [1981\Scientometrics3, 251.pdf](1981/Scientometrics3,%20251.pdf)

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Full Text: [1981\Scientometrics3, 265.pdf](1981/Scientometrics3,%20265.pdf)

Abstract: A mathematical model for the growth of two coupled mathematical specialties, differential geometry and topology, is analyzed. The key variable is the number of theorems in use in each specialty. Obsolescences of theorems-in-use due to replacement by more general theorems introduces non-linear terms of the differential equations. The stability of stationary solutions is investigated. The phase portrait shows that the number of theorems in low-dimensional topology relative to those in differential geometry is increasing. The model is qualitatively consistent with the growth of publications in these two specialties, but does not give quantitative predictions, partly because we do not use an explicit solutions as a function of time and partly because only two specialties are used. The methods of analysis and some of the concepts can be extended to the development of more general and realistic models for the growth of specialties.

Notes: UUniversity

? Rushton, J.P. and Meltzer, S. (1981), Research productivity, university revenue, and scholarly impact (citations) of 169 British, Canadian and United States universities (1977). *Scientometrics*, **3** (4), 275-303.

Full Text: [1981\Scientometrics3, 275.pdf](1981/Scientometrics3,%20275.pdf)

Abstract: One hundred and sixty-nine universities, comprising three separate samples from Britain, Canada, and the United States were evaluated in terms of their productivity across all disciplines. The 1977 *Arts and Humanities, Social Science,* and *Science Citation Indices* were used as the basis for counting the total number of publications from each of the universities. The 10 overall most productive universities were Harvard University, the University of Texas, the University of California, Los Angeles, the University of London, England, the University of Wisconsin, the University of. Illinois, the University of Minnesota, the University of California, Berkeley, Stanford University, and the University of Washington, Seattle. Fifteen of the most productive 100 universities were from the United Kingdom while eleven were from Canada. Additional data were collected including: the revenue of the university, the year the university was founded, the number of subscriptions to current periodicals, the number of bound volumes in the library, the aptitude scores and number of both graduate and undergraduate students, the total number of faculty members, and the number of publications of, reputational rating, and citations to, the faculty members in the psychology departments. A powerful general factor was found to permeate the more than 30 disparate measures, i.e., those universities that were high on one measure were high on others. This general factor could be labelled a dimension of wealth, quality, or size.

Keywords: United States

? Van Heeringen, A. (1981), Dutch research groups: Output and collaboration. *Scientometrics*, **3** (4), 305-315.

Full Text: [1981\Scientometrics3, 305.pdf](1981/Scientometrics3,%20305.pdf)

Abstract: In the Netherlands the research worker in the universities on an average publlsiaes in scientific journals three times as much as the scientist in industry. However, the universities differ considerably regarding their publications score per scientists, although this difference is diminishing. Furthermore this study shows per discipline the level of co-operation between Dutch and foreign research establishments. In general the level of co-operation with other research institutes has no positive effect on output. The analysis does show that the institutions with the largest financial support from the Research Council (an organization with the task of improving the output of research by means of fostering co-operation between research workers) are also the most productive ones.

Adamson, I. (1981), The size of science in the old Nigerian universities: A preliminary analysis. *Scientometrics*, **3** (4), 317-324.

Full Text: [1981\Scientometrics3, 317.pdf](1981/Scientometrics3,%20317.pdf)

Abstract: The scientific productivity of six old Universities in Nigeria has been computed over the period 1970-79. The order of contribution is by University of Ibadan, Ahmadu Bello University, Universities of Ire, Nigeria, Lagos and Benin. While there is a real growth in Scientific research in Nigeria as a whole, some of the Universities have problems which have put their research efforts on a downward trend. A new order of Scientific contributions by the Universities appears to be emerging. Constant Scientific growth analysis will help the new bodies involved in formulating and coordinating Science policy in Nigeria.

? Gieryn, T.F. (1981), The aging of a science and its exploitation of innovation: Lessons from X-ray and radio astronomy. *Scientometrics*, **3** (4), 325-334.

Full Text: [1981\Scientometrics3, 325.pdf](1981/Scientometrics3,%20325.pdf)

Abstract: Analysis of the growth of radio and X-ray astronomy in the 1960s suggests that future reductions in the size of entering cohorts of new doctorates in astronomy may lengthen the time needed to exploit future innovations, discoveries or breakthroughs. This may well tead to slower rates of advancement in astronomical knowledge. Most scientists making up the early growth of these two problem areas had *recently* earned their Ph. D’s, and, it was found, the probability of initiating research in radio or X-ray astronomy declined with the age of the scientist. Since smaller entering cohorts of new scientists would imply an overall aging of the astronomical community, the rate at which scientists will move in to exploit future innovations will probably be slower than during the periods of peak growth in the 1960s.

? Bruer, J.T. (1981), The cancer mission: Social contexts of biomedical research - Studer, KE, Chubin, DE. *Scientometrics*, **3** (4), 335-337.

Full Text: [1981\Scientometrics3, 335.pdf](1981/Scientometrics3,%20335.pdf)

? Hall, D.H. (1981), The earth and planetary sciences in science during the twentieth century. *Scientometrics*, **3** (5), 349-362.

Full Text: [1981\Scientometrics3, 349.pdf](1981/Scientometrics3,%20349.pdf)

Abstract: The earth and planetary sciences have shown remarkable changes during the present century. The relative coverage of earth and earth-planetary science in the journal *Science* (from the USA) was studied quantitatively at 5-year intervals for the period 1900-1976. Similar data, but more widely spaced, (10-year intervals) were obtained from the journal *Nature* (from Great Britain) as corroboration.

It was found in both journals that the relative attention given to earth science and to the combination of earth and planetary sciences dropped through the century to a low point about 1955. Thereafter the trend reversed, with both of these elements rising almost twice as rapidly as they had previously failer. A comparison with previous work on the production of American periodical literature showed similar trends but a consistently greater proportion of coverage of these subjects in *Science* than that in the literature, suggesting that the former is reflecting a wider spectrum of impact of these subjects than is the latter. General science journals may be a better indicator of impact of a science than is the specialized literature. The sim’flarity of results in the two journals indicates that the idea of patterns in world science is a valid one, in which the USA and Great Britain belong to a common pattern.

? Burke, C.E. and de Solla Price, D. (1981), The distribution of citations from nation to nation on a field by field basis: A computer calculation of the parameters. *Scientometrics*, **3** (5), 363-377.

Full Text: [1981\Scientometrics3, 363.pdf](1981/Scientometrics3,%20363.pdf)

Abstract: Following the methodology established by *Price,* this paper analyzes the empirical evidence of citation matrices. Using the data cleaned and tabulated by Computer Horizons, Inc. from the Science Citation Index data banks, it is shown that the non-diagonal elements of the square citation matrices can be accounted for very satisfactorily by assigning each nation a characteristic output and input coefficient in each field measured, the ratio of these coefficients provides a measure of quality. Deviations from this simple model give measures of particular linkage strengths between nations showing some evidence of preferences and avoidances that exist for reason of language, social structure, etc. It is also shown that the diagonal data can be accounted for by the measurable phenomenon that each nation seems to publish partly for the international knowledge system and partly for its own domestic purposes. Thus, three parameters and a cluster map can parsimoniously describe the citation data within the limits of random error.

? Schubert, A. and Braun, T. (1981), Some scientometric measures of publishing performance for 85 Hungarian research institutes. *Scientometrics*, **3** (5), 379-388.

Full Text: [1981\Scientometrics3, 379.pdf](1981/Scientometrics3,%20379.pdf)

Abstract: A sample comprising the three years publication output (1976–1978) of 85 Hungarian research institutes was subjected to scientometric analysis. Values of and correlations between some measures of publishing performance, scientific manpower, and citation impact were compared across the following research fields: mathematical and physical sciences, chemical sciences, biological and medical sciences, agricultural sciences, and engineering. A new quality measure of publishing performance, thetotal impact of the journal papers of individual institutes has been suggested.

? Hastings, T. (1981), A note on the utility of international publication data. *Scientometrics*, **3** (5), 389-396.

Full Text: [1981\Scientometrics3, 389.pdf](1981/Scientometrics3,%20389.pdf)

Abstract: This note focuses on a possible lh-nitation of international publication data as a measure of research activity. It is argued that differences in the ~pressure’ and/or ‘capacity’ to publish may exist between countries which would necessitate the standardization of publication data on a country basis. The argument is supported by statistical tests performed on data recently utilized to measure agricultural scientific research activity.

? Marton, J. (1981), Changes in the time distribution of biochemical article references from 1962 to 1977. *Scientometrics*, **3** (5), 397-400.

Full Text: [1981\Scientometrics3, 397.pdf](1981/Scientometrics3,%20397.pdf)

Abstract: Beside the continuous gtowth of the number of references per biochemical article from 1962 to 1977, an equalization tendency can be observed in the R/A values of the fi.ve leading biochemical journals investigated. While from 1962 to 1969 the number of more recent references (0-5 year old) had a hi~her growth rate than that of the older ones (6 § year old), from 1969 to 1977 the situation turned to the opposite. The number of very recent (0- I year old) references reached a saturation near the end of the sLxtJes.

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Full Text: [1981\Scientometrics3, 401.pdf](1981/Scientometrics3,%20401.pdf)

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Full Text: [1981\Scientometrics3, 415.pdf](1981/Scientometrics3,%20415.pdf)

Abstract: The Bradford distribution, differs from most probability distributions in that it is concerned with the.rank-order S of the elements in terms of their productivity (from highest down to lowest) rather than with the numerical values n of the element’s productivity. The defining relationship is that S is exponentially related to G, the Cumulative production of the elements of rank-order S or less. This implies a Zipf-like relationship between mean’ productivity and rank-order, which is analogous to the Weber-Fechner law of Psychophysics. A variational specification of the distribution is given, and it is pointed out that the relationship betweeen the construction of the Bradford and that of the usual distributions is roughly analogous to the relationship between Lebesgue and Riemann integration.

It has been pointed out in the past that many informational data fit the approximate formula for the Bradford distribution (where n is considered to be a continuous variable). It is shown that when the exact Bradford distribution is used (with productivity taken to be an integer, as it actually is) then the fit with the data is even better, clear down to n = 3, 2 and even 1. This is demonstrated by fits with data from the scatter of articles on operations research among journals and also with data on the citations to a single medical journal by articles in other journals. The paper also includes tables and formulas to enable the reader to fit the distribution to data of his choice.

? Brunk, G.G. and Jason, G.J. (1981), The impact of warfare on the rate of invention: A time series analysis of United States patent activity. *Scientometrics*, **3** (6), 437-455.

Full Text: [1981\Scientometrics3, 437.pdf](1981/Scientometrics3,%20437.pdf)

Abstract: The outbreak of war is generally thought to shift the fields in which research is conducted. As a result, military conflict has historically been credited with being the catalyst which has caused decisive technological advances. It is also generally suggested that warfare has a systematic impact on the intensity of inve~ative activity. Most scholars have claimed that wars increase inventiveness, although a few argue that conflict is a hinderance to research. This question has not received extensive empirical examination. Using United States data, we show that a basic pattern is repeatedly observed. Immediately after the outbreak of a war, there is a significant decline in inventiveness, which is followed by a marked surge. The average net result is a virtual negation of the two trends.

Keywords: United States

? Hurt, C.D. (1981), A test of differences in the literature history of four historical accounts of the quantum mechanics problem. *Scientometrics*, **3** (6), 457-466.

Full Text: [1981\Scientometrics3, 457.pdf](1981/Scientometrics3,%20457.pdf)

Abstract: This paper examines four historical accounts of the quantum mechanics problem in physics. The purpose is to describe the litrature used by the histories quantitatively using frequency of date of publication. Additionally, one of tile histories was tested against the or-her three, to determine differences’ A .Moments Test ~and a t Test were employed, The results indicated the literature history of quantum mechanics, when plotted as a function of frequency of publication date is non-normal, negatively skewed, avd is platykurtic. The test for difference between the one history and the cumulative histories was non-significant. Interpretations of the results are discussed.

? Cohen, J.E. (1981), Publication rate as a function of laboratory size in three biomedical research institutions. *Scientometrics*, **3** (6), 467-487.

Full Text: [1981\Scientometrics3, 467.pdf](1981/Scientometrics3,%20467.pdf)

Abstract: In three biomedical research institutions, there is no indication of a single laboratory size at which the number of publications per,scientist is maximal or minimal, In a scattergram of the numbe r of publications of a laboratory, against laboratory size, .the horizontal coordinate measures the number of scientists in a laboratory, the vertical axis measuresthe number of publications from the laboratory (counting each publication once regardless of the number of authors), and each laboratory is represented by one point. Scattergrams for the Rockefeller Ur~iversity (RU), New York, the National Institute for Medical Research (NIMR), London, and the National Cancer Institute ~(NCI), Bethesda, ~are each described well by a straight line through the origin. The slopes of the lines for the three institutions axe not significantly different. In these laboratories, ranging in, size from 1 to 46 scientists, one additional scientist increases the expected manual number of publications of a laboratory by approximately 1.1, regardless of the size of the laboratory. Although the three institutions have significantly different mean laboratory sizes, the frequency distribution of laboratory size in each institutior/is described well by a 0-truncated negative binomial distribution, as predictedby a simple model of laboratory population dynamics,

? Moravcsik, E.A. (1981), In the labyrinths of language: A mathematicians journey - Nalimov, VV. *Scientometrics*, **3** (6), 489-490.

Full Text: [1981\Scientometrics3, 489.pdf](1981/Scientometrics3,%20489.pdf)

? Menkes, J. (1981), Synthesis and analysis-methods for safety and reliability studies - Apostolakis, G, Garribba, S, Volta, A. *Scientometrics*, **3** (6), 491-492.

Full Text: [1981\Scientometrics3, 491.pdf](1981/Scientometrics3,%20491.pdf)

? Haitun, S.D. (1982), Stationary scientometric distributions: Part I. Different approximations. *Scientometrics*, **4** (1), 5-25.

Full Text: [1982\Scientometrics4, 5.pdf](1982/Scientometrics4,%205.pdf)

Abstract: Stationary distributions, i.e. distributions involving no time dependence, are analysed. The rank and frequency forms of statistical distributions are considered. On the basis of this consideration the approximations of stationary scientometric distributions are reviewed.

? Dobrov, G.M. and Dziekovskaya, I.V. (1982), Methods and results of studying the flow of information in the field of thin-film superconductivity. *Scientometrics*, **4** (1), 27-44

Full Text: [1982\Scientometrics4, 27.pdf](1982/Scientometrics4,%2027.pdf)

Abstract: This paper deals with a physical-statistical analysis on the information flows in the field of superconductive thin films for 1949 to 1977. The classification of scientific research is done and an attempt is made to determine the correlations between the different types. The dynamics of growth of the number of publications is considered, and changes of researchers’ scientific interests concerning the application of various chemical materials and structures in superconductive thin films are studied. The problems of professional mobility are also investigated. Conclusions are drawn on the development of the described field.

? Kochen, M., Crickman, R. and Blaivas, A. (1982), Distribution of scientific experts as recognized by peer consensus. *Scientometrics*, **4** (1), 45-56

Full Text: [1982\Scientometrics4, 45.pdf](1982/Scientometrics4,%2045.pdf)

Abstract: Peex review plays an important role in maintaining the quality of science. Selection of peers is at the heart of the process by which science advances Editors and others responsible for selecting a group of peers often rely on their position in a network by which experts in a field are linked to one another by bonds of common interest and recognized expertise. In this paper, we report one aspect of a study aimed at characterizing the structure of this network: the asymmetry of the fraction of experts receiving varying numbers of nominations as experts by peers. The distribution of such nominations is very skew, and we have found that a law of cumulative advantage provides the best theoretical approximation for the distribution of nominations, expecially when the overall pool of data is broken down into well-defined specialties.

? Zsindely, S., Schubert, A. and Braun, T. (1982), Editorial gatekeeping patterns in international science journals. A new science indicator. *Scientometrics*, **4** (1), 57-68.

Full Text: [1982\Scientometrics4, 57.pdf](1982/Scientometrics4,%2057.pdf)

Abstract: Significant correlations were found between the number of science journal editors from different countries, on the one hand, and the number of scientists, the number of science journals and the number of science papers produced by these countries on the other. We argue for using the extent of participation in the editorial board of international science journals as a new science indicator. The deviations from the regression lines between the new indicator and other publication indicators allow one to assess the ‘open’ or ‘closed’ character of the scientific life of a given country.

? Zsindely, S., Schubert, A. and Braun, T. (1982), Citation patterns of editorial gatekeepers in international chemistry journals. *Scientometrics*, **4** (1), 69-76.

Full Text: [1982\Scientometrics4, 69.pdf](1982/Scientometrics4,%2069.pdf)

Abstract: A significant correlation was found between the mean number of citations to the editors of international chemistry journals and the impact factor of the journals in question. A much weaker correlation was found if citations to the editor(s)-in-chief only were considered, this suggests that the professional profile of the journal is determined by the editorial board rather than the person of the editor(s)-in-chief. The number of citations to the editors of international chemistry journals may be used for characterizing a country’s chemical research activity.

? Haitun, S.D. (1982), Scientometric analysis of information flows in chemistry - Granovsky, YV. *Scientometrics*, **4** (1), 77-79.

Full Text: [1982\Scientometrics4, 77.pdf](1982/Scientometrics4,%2077.pdf)

? Frame, J.D. (1982), Management of research and innovation - Dean, BV, Goldhar, JL. *Scientometrics*, **4** (1), 79-80.

Full Text: [1982\Scientometrics4, 79.pdf](1982/Scientometrics4,%2079.pdf)

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Full Text: [1982\Scientometrics4, 80.pdf](1982/Scientometrics4,%2080.pdf)

? Haitun, S.D. (1982), Stationary scientometric distributions: Part II. Non-gaussian nature of scientific activities. *Scientometrics*, **4** (2), 89-104.

Full Text: [1982\Scientometrics4, 89.pdf](1982/Scientometrics4,%2089.pdf)

Abstract: Stationary distributions, i.e. distributions involving no time dependence, are considered. It is shown that all these distributions in scientometrics can be approximated by the Zipf distribution at high values of variables. The sample moments appear to depend significantly on the sample size. Accordingly, the approximation of these observational data by probability distributions converging to a stable distribution different from the normal one proves to be the only correct approximation. The conclusion is formulated that the use of non-Gaussian statistics is necessary in the science of science and other social sciences.

? Chapman, I.D. and Farina, C. (1982), Concentration of resources: The National-Research-Council’s (Canada). *Scientometrics*, **4** (2), 105-117.

Full Text: [1982\Scientometrics4, 105.pdf](1982/Scientometrics4,%20105.pdf)

Abstract: Concentration of resources continues to be an important issue in the formulation of policy for the support of university research. In this paper, techniques for quantitatively assessing two dimensions of this issue, ‘between’ and ‘within’ committee concentrations, are developed. These techniques are applied in an analysis of the peer-adjudicated grants of the National Research Council of Canada for the years 1964-1974 inclusive. Results indicate that although ‘between’ committee concentrations have responded to changing priorities for university research, ‘within’ committee concentrations have remained remarkably stable over this decade. This is seen as having important implications for recent attempts at re-orienting university research in Canada.

Keywords: Canada

? Jagodzinski-Sigogneau, M., Courtial, J.P. and Latour, B. (1982), How to measure the degree of independence of a research system. *Scientometrics*, **4** (2), 119-133.

Full Text: [1982\Scientometrics4, 119.pdf](1982/Scientometrics4,%20119.pdf)

Abstract: The French bibliographic data-base PASCAL is used to study relations between Research Systems in terms of dependance of a periphery upon a Center.

The deployment of disciplines, the productivity and the use of mother tongue of 9 developped countries are quantified (on the Life Science file only).

This dependance is also quantified by reference to who studies whom, and in which language the results are available. A search in Life Science and Earth Science files by means of subject terms added by PASCAL indexers at input to papers published by 5 developped countries working on fourteen Latino-american and African countries.

? Blickenstaff, J. and Moravcsik, M.J. (1982), Scientific output in the third-world. *Scientometrics*, **4** (2), 135-169.

Full Text: [1982\Scientometrics4, 135.pdf](1982/Scientometrics4,%20135.pdf)

Abstract: Although such indicators exhibit only certain aspects of the contribution of science to a country, the number of scientific authors in a given year is plotted for every year between 1971 and 1976, inclusive, and the number of scientific authors divided by the population of the country is also given for those years. The number of scientific authors is the number of scientists who published at least one article in a journal in that given year. The data were taken from a survey which, although it covers only about 4000 scientific journals, includes a large fraction of all articles published.

The results are given in 43 graphs, the first 17 of which show the number of authors and the second 16 the authors per capita. The graphs are divided according to geographical areas: Latin America, Africa, the Middle East, and Asia, and within each region countries with roughly comparable output or output per capita are grouped together.

The last ten graphs show the growth rates of authors and of authors per capita, compared to the 1971 values, for groups of countries aggregated according to various parameters with which correlation is being investigated. Continent, size of population literacy rate about 25 years before, the percentage of gross national product spent on military expenditures, and colonial past.

? Inhaber, H. (1982), Coping with the biomedical literature: Warren, KS. *Scientometrics*, **4** (2), 171-172.

Full Text: [1982\Scientometrics4, 171.pdf](1982/Scientometrics4,%20171.pdf)

? Schubert, A. (1982), How to grow science - Moravcsik, MJ. *Scientometrics*, **4** (2), 172-173.

Full Text: [1982\Scientometrics4, 172.pdf](1982/Scientometrics4,%20172.pdf)

? Haitun, S.D. (1982), Stationary scientometric distributions: Part III. The role of the Zipf distribution. *Scientometrics*, **4** (3), 181-194.

Full Text: [1982\Scientometrics4, 181.pdf](1982/Scientometrics4,%20181.pdf)

Abstract: The non-Gaussian character of scientific activity is discussed. This character makes correct only non-Gaussian approximations of stationary distributions of scientific activity. Deviation of different non-Gaussian approximations from the Zipf distribution can be explained in some cases by distortion introduced by the observer. The hypothesis that latent stationary distributions of scientific (and generally human) activity for separate person are always described by the Zipf distribution is formulated using the considerations connected with the variational entropy and the Zigler principles.

Keywords: Zipf

? Haigh, M.J. (1982), Citation analysis of foreign sources in Japanese geographical serials. *Scientometrics*, **4** (3), 195-203.

Full Text: [1982\Scientometrics4, 195.pdf](1982/Scientometrics4,%20195.pdf)

Abstract: A comparison of sources cited in the Japanese language Geographical Review of Japan and six western language, Japanese geographical serials reveals that while both cite the same proportion of foreign sources (a third), authors tend to select Japanese sources which are written in the language of the host publication. Foreign sources in the Japanese literature are overwhelmingly from the English language world, especially the United States, with a small admixture in German, from the F.R. Germany. The proportion of foreign sources in the Japanese literature appears to be in decline.

? Noma, E. (1982), The simultaneous scaling of cited and citing articles in a common space. *Scientometrics*, **4** (3), 205-231.

Full Text: [1982\Scientometrics4, 205.pdf](1982/Scientometrics4,%20205.pdf)

Abstract: Scientific articles may be represented as points in a space whose spatial pattern reflects some of the substantive and social structures of science. The proximity of articles and the documents they reference leads to a eentroid sealling method proposed in this paper. This method scales citing articles as close as possible to the articles they reference. The simultaneous scaling of citing and cited articles in a common space aids in the interpretation of the resultant configuration.

? Moravcsik, M.J. (1982), The social-process of scientific investigation - Knorr, KD, Krohn, R, Whitley, R. *Scientometrics*, **4** (3), 233-234.

Full Text: [1982\Scientometrics4, 233.pdf](1982/Scientometrics4,%20233.pdf)

? Hjerppe, R. (1982), Supplement to a ‘Bibliography of bibliometrics and citation indexing & analysis’ (Trita-lib-2013). *Scientometrics*, **4** (3), 241-274.

Full Text: [1982\Scientometrics4, 241.pdf](1982/Scientometrics4,%20241.pdf)

Keywords: Bibliometrics

? Bonitz, M. and Schmidt, P. (1982), Transition from the macrolevel to the microlevel of information at rank distribution investigations of the report literature of an international information-system. *Scientometrics*, **4** (4), 283-295.

Full Text: [1982\Scientometrics4, 283.pdf](1982/Scientometrics4,%20283.pdf)

Abstract: The coincidence method proposed earlier by one of the authors is applied to rank distribution studies of the report literature of the International Nuclear Information System, INIS, and a two-level concept is used to discuss the results of the present and previously reported investigations. Transitions between’ macrolevel and microlevel of information for constant forms of eommuhication as well as transitiong between different forms of commu, nication at constant levels are compared. Escape of the information avalanche for the highly specialized single scientist, greater efficiency of the report literature compared with journal literature in the field of nuclear research, non-compatibility of macrolevel and microlevel of information could be confu-med quantitatively. It is an open question how to transform microlevel distributions into mactolevel distributions.

? Noma, E. (1982), An improved method for analyzing square scientometric transaction matrices. *Scientometrics*, **4** (4), 297-316.

Full Text: [1982\Scientometrics4, 297.pdf](1982/Scientometrics4,%20297.pdf)

Abstract: Modeling the number of citations from one journal to another may be done by assuming independent contributions from the referencing journal and from the cited journal. Empirical and theoretical evidence, however, indicates that self-citations are different from interjournal citations. For this reason a model is proposed that separates the analysis of selfcitations from inter-citations. In addition, a model is proposed that adjusts the expected citation counts by the journal to journal similarity. Computational procedures for fitting coefficients of the models to the observed citation pattern are described along with a statistical method for evaluating the validity of the model.

? Shelishch, P.B. (1982), A quantitative study of biologists in the 18th and 19th centuries. *Scientometrics*, **4** (4), 317-329.

Full Text: [1982\Scientometrics4, 317.pdf](1982/Scientometrics4,%20317.pdf)

Abstract: In recent literature dealing with the study of science and history of science increasing attention has been given to quantitative research of science as a special social institution. Main objects of these studies are the dynamics of quantity and structure of scientists, as well as change in forms of their professional organization. The understanding of regularities in the development of the scientific community is essential for the formulation of reasonable scientific policies. However, the experience shows that tendencies of this kind cannot be revealed if the study of science is restricted to the last two or three decades. It is necessary to examine sufficiently long periods of history during which several generations of scientists changed, large variations occured both in the internal scientific situation and in the socio-economic and concrete historical conditions of the development of science.

? Stefaniak, B. (1982), Individual and multiple authorship of papers in chemistry and physics. *Scientometrics*, **4** (4), 331-337.

Full Text: Scientometrics4, 331

? Blickenstaff, J. (1982), Correction. *Scientometrics*, **4** (4), 345.

Full Text: Scientometrics4, 345.pdf

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Full Text: [1982\Scientometrics4, 349.pdf](1982/Scientometrics4,%20349.pdf)

Abstract: The Consumption Factor has been proposed.as a new measure of the significance/quahty of scientific journals. The scientometric properties of this measure and its relationship to other commonly used measures of journal significance were examined. The results indicate a high correlation between the two component measures used to construct the Consumption Factor and a weak relationship between the Consumption Factor and other measures traditionally used to assess journal significance. The implications of these results are discussed in the context of the need for multiple measures of the significance of scientific journals.

? Koenig, M.E.D. (1982), Determinants of expert judgment of research performance. *Scientometrics*, **4** (5), 361-378.

Full Text: [1982\Scientometrics4, 361.pdf](1982/Scientometrics4,%20361.pdf)

Abstract: The relationship between indicators of and expert Judgement of, research performance were compared in the context of mission oriented pharmaceutical research. Expert judgment is very highly correlated with measures of publication activity, much more so than with very plausible measures of research output and research quality. Furthermore, expert judgement appears to be an additive function of publication size (another name for which might be visibility) and publication quality, with the principal component being size/visibility. These results are very similar to those found by *Anderson, Narin, and MeAllister* in the context of academic research, but these findings emerge froma context which allows other variables to compete in predicting expert Judgement, and are therefore to that degree more robuts. In addition this study finds a clear pattern of subject specificity, which implies that visibility is a function of the judge’s subject field.

? Long, J.S. and Mcginnis, R. (1982), On adjusting productivity measures for multiple authorship. *Scientometrics*, **4** (5), 379-387.

Full Text: [1982\Scientometrics4, 379.pdf](1982/Scientometrics4,%20379.pdf)

? Lindsey, D. (1982), Further evidence for adjusting for multiple authorship. *Scientometrics*, **4** (5), 389-395.

Full Text: [1982\Scientometrics4, 389.pdf](1982/Scientometrics4,%20389.pdf)

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Full Text: [1982\Scientometrics4, 397.pdf](1982/Scientometrics4,%20397.pdf)

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Full Text: [1982\Scientometrics4, 399.pdf](1982/Scientometrics4,%20399.pdf)

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Full Text: [1982\Scientometrics4, 400.pdf](1982/Scientometrics4,%20400.pdf)

Keywords: Europe

? Mcallister, P.R. (1982), Applied time-series analysis for the social-sciences: Mccleary, R, Hay, RA. *Scientometrics*, **4** (5), 401-403.

Full Text: [1982\Scientometrics4, 401.pdf](1982/Scientometrics4,%20401.pdf)

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Full Text: [1982\Scientometrics4, 403.pdf](1982/Scientometrics4,%20403.pdf)

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Full Text: [1982\Scientometrics4, 411.pdf](1982/Scientometrics4,%20411.pdf)

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Full Text: [1982\Scientometrics4, 417.pdf](1982/Scientometrics4,%20417.pdf)

Abstract: Several studies have demonstrated that such factors as area of specialization, and the age, rank, years of experience and prestige background of authors affect the publication of scientific research. This study examines the impact of these variables on the probability that published articles will receive critical comment. The data for the study are based on information gathered on the authors of 477 articles and comments published in the *American Sociological Review* over a 33 year period (1947-1979). Results show that area of specialization is a major factor influencing the probability of an article being commented on. Articles written in the areas of theolT/history of social thought and quantitative methods receive a disproportionately higher percentage of comments, while articles in such areas as community, social psychology and marriage and family receive far fewer comments. None of the five demographic and prestige characteristics of article authors was found to significantly discriminate between those articles that either had or had not been commented on. And f’mally, journal article comments are shown to either enhance or diminish an article’s likelihood of later being cited, depending upon the speciality area in which that article is written.

? Yankevich, W.F. (1982), Analysis of publication and invention productivity in some soviet academic institutions. *Scientometrics*, **4** (6), 431-437.

Full Text: [1982\Scientometrics4, 431.pdf](1982/Scientometrics4,%20431.pdf)

Abstract: Some peculiarities and tendencies of the productivity of publication and invention activities for a large group of academic institutions of different scientific type of the Ukrainian SSR conducting research in the field of natural and technical sciences have been revealed.

? Braun, T. and Nagy, J.I. (1982), A comparative-evaluation of some Hungarian and other national biology, chemistry, mathematics and physics journals. *Scientometrics*, **4** (6), 439-455.

Full Text: [1982\Scientometrics4, 439.pdf](1982/Scientometrics4,%20439.pdf)

Abstract: This paper analyses the publication process of journal papers using a comparative methodology based on two indicators: the publishing delay of the manuscripts and the nationality of authors publishing in the journals under study. Using these indicators Hungarian foreign language journals are compared with some national journals of other countries

? Kretschmer, H. (1983), Representation of a complex structure measure for social-groups and its application to the structure of citations in a journal. *Scientometrics*, **5** (1), 5-30.

Full Text: [1983\Scientometrics5, 5.pdf](1983/Scientometrics5,%205.pdf)

Abstract: A complex structure measure for social groups was established with a view to reflecting the degree of interaction within a social group. The quantitative degrees of relationship between two group members each and their distributions within the group are considered. These distributions can be characterized quantitatively on different hierarchical levels to which a specific meaning can be attributed. The complex structure measure is a combination of measures for the different hierarchical levels. A stratification of scientists based on the number of publications in a journal is reflected in the results obtained by the complex structure measure. Specific information is provided both by the complex structure measure and by the measure on different levels.

? Soete, L.G. and Wyatt, S.M.E. (1983), The use of foreign patenting as an internationally comparable science and technology output indicator. *Scientometrics*, **5** (1), 31-54.

Full Text: [1983\Scientometrics5, 31.pdf](1983/Scientometrics5,%2031.pdf)

Abstract: Foreign patenting activity in some of the world major patent systems is being compared between countries and industries and is found to be, with a few notable exceptions, relatively unbiased. Furthermore, a brief dynamic analysis of the foreign patenting activity in the USA of a number of OECD-countries in 41 industrial sectors in terms of ‘Revealed Technological Advantage’ indices suggests that foreign patent data might provide a very useful addition to the arsenal of Science and Technology Output Indicators.

? Slater, P.B. (1983), Hierarchical-clustering of mathematical journals based upon citation matrices. *Scientometrics*, **5** (1), 55-58.

Full Text: [1983\Scientometrics5, 55.pdf](1983/Scientometrics5,%2055.pdf)

Abstract: Journal-to-journal citation matrices can be examined with a two-stage double-standardization and hierarchical clustering procedure that has been widely applied to other transaction flow tables. An illustration is given, using 1967-1975 citations between 22 mathematical journals. Groups oriented to analysis and to algebra are discerned. Certain journals, such as the *Proceedings of the American Mathematical Society, are* shown to have broad, nonspecialized ties with the other periodicals.

? Schubert, A. and Glänzel, W. (1983), Statistical reliability of comparisons based on the citation impact of scientific publications. *Scientometrics*, **5** (1), 59-74.

Full Text: [1983\Scientometrics5, 59.pdf](1983/Scientometrics5,%2059.pdf)

Abstract: A method for estimating the standard error of mean citation rates per publication is proposed and examplified on journal impact factors. The use of the standard error values in statistical tests is also illustrated.

? Bond, J.S. (1983), The Use of International patenting statistics as indicators of inventive activity. *Scientometrics*, **5** (1), 77.

Full Text: [1983\Scientometrics5, 77.pdf](1983/Scientometrics5,%2077.pdf)

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Full Text: [1983\Scientometrics5, 78.pdf](1983/Scientometrics5,%2078.pdf)

? Campbell, R.S. and Thompson, C.E. (1983), Patent citation analysis. *Scientometrics*, **5** (1), 78.

Full Text: [1983\Scientometrics5, 78.pdf](1983/Scientometrics5,%2078.pdf)

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Full Text: [1983\Scientometrics5, 78.pdf](1983/Scientometrics5,%2078.pdf)

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Full Text: [1983\Scientometrics5, 79.pdf](1983/Scientometrics5,%2079.pdf)

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Full Text: [1983\Scientometrics5, 79.pdf](1983/Scientometrics5,%2079.pdf)

? Hargens, L.L. and Felmlee, D.H. (1983), Effects of structural characteristics of scientific fields on measures of the inequality of recognition of scientists. *Scientometrics*, **5** (1), 80.

Full Text: [1983\Scientometrics5, 80.pdf](1983/Scientometrics5,%2080.pdf)

? Mcallister, P.R. and Narin, F. (1983), Analysis of the contribution of scientific instrumentation to highly cited research. *Scientometrics*, **5** (1), 80.

Full Text: [1983\Scientometrics5, 80.pdf](1983/Scientometrics5,%2080.pdf)

? Morley, J. (1983), Sociobiology in science, 1975-1979: A bibliometric study. *Scientometrics*, **5** (1), 80.

Full Text: [1983\Scientometrics5, 80.pdf](1983/Scientometrics5,%2080.pdf)

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Full Text: [1983\Scientometrics5, 81.pdf](1983/Scientometrics5,%2081.pdf)

? Vlachy, J. (1983), Performance inequality in scientific disciplines. *Scientometrics*, **5** (1), 81.

Full Text: [1983\Scientometrics5, 81.pdf](1983/Scientometrics5,%2081.pdf)

Notes: UUniversity

? Rushton, J.P., Murray, H.G. and Paunonen, S.V. (1983), Personality, research creativity, and teaching effectiveness in university professors. *Scientometrics*, **5** (2), 93-116.

Full Text: [1983\Scientometrics5, 93.pdf](1983/Scientometrics5,%2093.pdf)

Abstract: Two separate studies were undertaken of the personality characteristics associated with research creativity and teaching effectiveness in university psychology professors. In the first study, 52 professors at The University of Western Ontario were evaluated on 29 trait dimensions using four assessment techniques: faculty peer ratings, student ratings, self ratings, and objective questionnairees. A composite criterion of reseach creativity was generated from publication and citation counts. A composite for teaching effectiveness was created from 5 years of archival data based on formal student evaluations. The personality measures demonstrated considerable convergence across modes of assessment for many traits. In turn, several traits differentiated between most and least creative researchers and most and least effective teachers. A second study, using a self report survey sent to 400 professors in graduate psychology departments at 9 Canadian universities, revealed substantial replications of the findings of Study 1. Limiting ourselves to those personality traits that reliably loaded on Research and Teaching factors in both studies, we may describe the creative researcher as ambitious, enduring, seeking definiteness, dominant, showing leadership, aggressive, independent, non-meek, and non-supportive. The effective teacher is best described as liberal, sociable, showing leadership, extraverted, nonanxious, objective, supporting, non-authoritarian, non-defensive, intelligent, and aesthetically sensitive.

? Roy, R., Roy, N.R. and Johnson, G.G. (1983), Approximating total citation counts from 1st author counts and from total papers. *Scientometrics*, **5** (2), 117-124.

Full Text: [1983\Scientometrics5, 117.pdf](1983/Scientometrics5,%20117.pdf)

Abstract: ]his paper is an attempt to improve on the approximation. First author itations (Cf) ~ Total citations (Ct) of an author’s publications without the work of making the complete citation count under the author and all co-author names.

Using the bibliographies of all faculty from each of four large departments: Physics, Chemistry, Materials Sciences, and Biosciences, in the same university, both first author and complete citation counts were made, care being taken to avoid the most common errors in such counts. It is shown that the function Cf T/F (where T and F are the total number of papers and F thosc with subject author’s namc first) correlates strongly (> 90%) with C t. We find also that C t correlates strongly with T.

The data also may be used as one more line of evidence to obtain normalizing ratios for possible comparisons of productivity *across* different disciplinary universes. A very tentative ratio from different studies would be 8 (Chem.) = 4 (Physics) = 2.5 (Mat. Sci.) = 2 (Mathematics) = 4.5 (Biophysics-Biochemistry).

? Schubert, A. (1983), Quantitative studies of science: A current bibliography. *Scientometrics*, **5** (2), 125-133.

Full Text: [1983\Scientometrics5, 125.pdf](1983/Scientometrics5,%20125.pdf)

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Full Text: [1983\Scientometrics5, 135.pdf](1983/Scientometrics5,%20135.pdf)

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Full Text: [1983\Scientometrics5, 137.pdf](1983/Scientometrics5,%20137.pdf)

Notes: MModel

? Kretschmer, H. (1983), The reflection of Lotka’s law in the structure of citations of a journal. *Scientometrics*, **5** (2), 85-92.

Full Text: [1983\Scientometrics5, 85.pdf](1983/Scientometrics5,%2085.pdf)

Abstract: A complex structure measure for social groups was applied to the structure of citations in a journal. The citation structure reflected Lotka’s law on the various levels of group structure measure. On the first structure level the reciprocal effect of social and cognitive factors became discernible. The different hierarchical levels of the structure measure were a reflection of the logarithm of number of publications per author obtained in a group of authors with a definite number of publications.

Keywords: Lotka

? Blickenstaff, J. and Moravcsik, M.J. (1983), The profile of an international meeting. *Scientometrics*, **5** (3), 143-154.

Full Text: [1983\Scientometrics5, 143.pdf](1983/Scientometrics5,%20143.pdf)

Abstract: The aim of this study was to investigate the professional profile of participants in the ‘ACAST Colloquium’, one of the preliminary conferences leading to the United Nations Advisory Committee on Application of Science and Technology to Development (UNCSTD) meeting in Vienna in August of 1979, in order to study the different profile parameters of developing and ‘developed’ country participants. We found that the developing countries seem to have a higher proportion of women and younger people than the “developed’ countries. Participants on the whole tended to be older than a cross-section of the scientific and technological community. Approximately three-quarters considered themselves to be scientists rather than technologists. The scientists tended to be involved in some way with R & D, scientific or technological education, as well as management and administration. On the whole, the distribution of various parameters investigated was quite similar for developing and ‘developed’ countries. Some interpretations of these results are offered.

? Snizek, W.E. and Hughes, M. (1983), An empirical assessment of the validity of mullins theory group classifications. *Scientometrics*, **5** (3), 155-162.

Full Text: [1983\Scientometrics5, 155.pdf](1983/Scientometrics5,%20155.pdf)

Abstract: Using a random sample of 79 theorists selected from among six of Mullins’ theory groups, this study attempts to empirically assess the validity of Mullins’ theory group classifications. The procedure involved utilizes multiple discriminant analysis based on four demographic-academic variables standardized relative to the publication date of the first major work written by each theorist. Results of the discriminant analysis indicate 70 percent of 40 cases, for whom complete data were available, are correctly classified, based on Mullins’ initial categorizations. These results show Mullins’ classification schema as having considerable construct validity, as well as demonstrating the utility of using multiple discriminant analysis as a technique for assessing other classificatory systems.

? Davis, C.H. (1983), Institutional sectors of mainstream science production in subsaharan Africa, 1970-1979: A quantitative-analysis. *Scientometrics*, **5** (3), 163-175.

Full Text: [1983\Scientometrics5, 163.pdf](1983/Scientometrics5,%20163.pdf)

Abstract: The place of production of ‘mainstream’ scientific authors in Subsaharan Africa is examined in terms of institutional sectors for the period 1970 through 1979. Patterns of production of ‘mainstream’ scientific literature and the citation visibility of this literature are also examined, for a shorter period of time, in terms of institutional sectors. It is shown that the university and public sectors predominate in the production of ‘mainstream’ authors. These same sectors also assure more consistent intra-African visibility of research results than do other sectors. However, the growth of the university and public sectors appears to have slowed considerably since the mid-1970s. Research conducted within regional and subregional cooperative organizations declined dramatically during the decade. A growing emphasis on external interventions under multilateral (rather than bilateral) auspices is noted.

? Schubert, A., Zsindely, S. and Braun, T. (1983), Scientometric analysis of attendance at international scientific meetings. *Scientometrics*, **5** (3), 177-187.

Full Text: [1983\Scientometrics5, 177.pdf](1983/Scientometrics5,%20177.pdf)

Abstract: International scientific meetings represent important channels for communicating research results. Based on data from more than 500 proceedings of scientific meetings, organization and participation patterns of several countries (or geopolitical regions) were analyzed. Some new indicators were derived and proved to be useful in characterizing the scientific activity of the countries. Particularly, the ‘open’ and ‘closed’ nature of national scientific communities, as well as ‘attraction’ and ‘repulsion’ between certain pairs of countries could be revealed by this method.

? Schubert, A. (1983), Quantitative studies of science: A current bibliography. *Scientometrics*, **5** (3), 189-194.

Full Text: [1983\Scientometrics5, 189.pdf](1983/Scientometrics5,%20189.pdf)

? Rabkin, Y.M. (1983), Science indicators 1978 - Natl-Sci-Fdn-Natl-Sci-Board. *Scientometrics*, **5** (3), 195-197.

Full Text: [1983\Scientometrics5, 195.pdf](1983/Scientometrics5,%20195.pdf)

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Full Text: [1983\Scientometrics5, 197.pdf](1983/Scientometrics5,%20197.pdf)

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Full Text: [1983\Scientometrics5, 199.pdf](1983/Scientometrics5,%20199.pdf)

? Moravcsik, M.J. (1983), The science profession in the third-world: Studies from India and Kenya - Eisemont, TO. *Scientometrics*, **5** (3), 202-203.

Full Text: [1983\Scientometrics5, 202.pdf](1983/Scientometrics5,%20202.pdf)

Keywords: India, Kenya

? Peritz, B.C. (1983), Are methodological papers more cited than theoretical or empirical ones? The case of sociology. *Scientometrics*, **5** (4), 211-218.

Full Text: [1983\Scientometrics5, 211.pdf](1983/Scientometrics5,%20211.pdf)

Abstract: The objective of this study is to f’md out whether methodological papers published in core sociological journals are more frequently cited than theoretical or empirical (substantive) papers. The results indicate that such is indeed the ease, moreover, this result is not due to a few ‘outlying’, very highly cited papers. These findings are based on all the methodological and theoretical papers, and a sample of the empirical papers, published in 1972 and 1973 in three high-impact sociological journals. The citation counts for these papers were compiled from the *Social Science Citation lndex* for the years 1972-1981. The data were analyzed separately for each journal and year of publication.

? Eto, H. and Makino, K. (1983), Stochastic-model for innovation and resulting skew distribution for technological concentration with verification in Japanese industry. *Scientometrics*, **5** (4), 219-243.

Full Text: [1983\Scientometrics5, 219.pdf](1983/Scientometrics5,%20219.pdf)

Abstract: Technological resources are shown to be more concentrated to a few firms than economic wealth. To explain such concentrations, the self-multiplication process with cycle between the innovative and stagnant ages is modeled in terms of the stochastic process. This yields a family of new distributions which is named the ultra-Yule distribution. This new distribution which is quite skew is shown to fit the real distributions of patents and of R & D expenditure in the Japanese industry better than the Yule distribution. The properties of this new distribution is discussed.

? Baldauf, R.B. and Jernudd, B.H. (1983), Language use patterns in the fisheries periodical literature. *Scientometrics*, **5** (4), 245-255.

Full Text: [1983\Scientometrics5, 245.pdf](1983/Scientometrics5,%20245.pdf)

Abstract: A cross-sectional examination of the fisheries literature for 1978 was made to see how language use patterns were related to communicating research information. An analysis of 884 articles indicated that despite the dominance of English as an international communicative medium, there was a strong national language usage pattern. National language usage was not confined to local fisheries problems, but cut across issues of international importante. For most of the articles the language of publication was directly predictable from the first author’s country of residence. However the mismatch between these variables for about six percent of the sample suggested the need for a detailed study of individual cases.

? Vanhouten, J., Vanvuren, H.G., Lepair, C. and Dijkhuis, G. (1983), Migration of physicists to other academic disciplines: Situation in the Netherlands. *Scientometrics*, **5** (4), 257-267.

Full Text: [1983\Scientometrics5, 257.pdf](1983/Scientometrics5,%20257.pdf)

Abstract: ‘Field switchers’ are an interesting group of people to study ff one wants to find out to what extent and the ways in which the various scientific disciplines influence each other. In this paper we present and discuss the results of an inquiry that was conducted at Dutch universities among one particular type of field switchers, namely migrated physicists. By migrated physicists we mean physicists working in universities but not in physics departments. Although migrated physicists form a very heterogeneous group one can draw some general conclusions about their attitudes, characteristics and capacities. Migrated physicists apparently continue to feel themselves to be physicists, and they think that physics or natural sciences should play a greater role in their ‘adopted’ fields. At least in the case of *physicists,* field-mobility seems to be linked with general mobility. Migrants parform a useful and important service.

Keywords: the Netherlands

? Moravcsik, M.J. (1983), Organization for economic cooperation and development: Science and technology policy for the 1980s. *Scientometrics*, **5** (4), 269-270.

Full Text: [1983\Scientometrics5, 269.pdf](1983/Scientometrics5,%20269.pdf)

? Moravcsik, M.J. (1983), Quality in science: Lafollette, MC. *Scientometrics*, **5** (4), 270-272.

Full Text: [1983\Scientometrics5, 270.pdf](1983/Scientometrics5,%20270.pdf)

? Mccain, K.W. (1983), The author co-citation structure of macroeconomics. *Scientometrics*, **5** (5), 277-289.

Full Text: [1983\Scientometrics5, 277.pdf](1983/Scientometrics5,%20277.pdf)

Abstract: Cocitations of the work of 42 prominent macroeconomists (past and present) were examined, using multidimensional scaling and clustering techniques. Author clusters, corresponding primarily to current schools of thought in macroeconomics, are arranged along two dimensions of scholarly style, 1) a relative orientation toward quantitative or *mathematical models* and *issues* and 2) a *continuum of active concern* with older scholarship in the field. Social relationships demonstrated by these techniques include joint journal editorship, mentor-student links and institutional affiliation. New to this study is evidence of the eocitation of prominent authors as ‘concept symbols’.

? Todorov, R. (1983), Condensed matter physics journals. *Scientometrics*, **5** (5), 291-301.

Full Text: [1983\Scientometrics5, 291.pdf](1983/Scientometrics5,%20291.pdf)

Abstract: On the basis of a citation/reference criterion, 20 core journals are selected in the field of condensed matter physics. Citation data and indicators from *1980Journal Citation Reports* reveal their different characteristic features such as applied orientation, communication function and longevity. The manually obtained data for the core journals are written into a matrix in order to determine an appropriate ranking parameter. The method of *Price* is used first to reduce the diagonal elements and then, following the method of *Geller,* influence weights are calculated for the core journals. Influence weights are determined also for non-core journals using only the references received from the core.

? Peritz, B.C. (1983), A Classification of citation roles for the social-sciences and related fields. *Scientometrics*, **5** (5), 303-312.

Full Text: [1983\Scientometrics5, 303.pdf](1983/Scientometrics5,%20303.pdf)

Abstract: The paper proposes a classification scheme for the roles of citations in empirical studies from the social sciences and related fields. The use of the classification, which has eight categories, is illustrated in sociology, education, demography, epidemiology and librarianship, its association with the citations’ location within the paper is presented. The question of repeated citations of the same document is discussed. Several research questions to which this classification is relevant are proposed. The need for further critique, validation and experimentation is pointed out.

? Gregory, J.G. (1983), Citation study of a scientific revolution: Sudden infant death syndrome. 1. The new paradigm. *Scientometrics*, **5** (5), 313-327.

Full Text: [1983\Scientometrics5, 313.pdf](1983/Scientometrics5,%20313.pdf)

Abstract: The sudden infant death syndrome (SIDS) provides an example of a scientific revolution something like that proposed by Thomas Kuhn. In the early 70s a variety of theories within the paradigm that SIDS affects ‘normal’ children were superseded by the sleep apnea hypothesis, which is the main theory associated with the new paradigm, that some infants have respiratory abnormalities which put them at risk of ‘near misses’ of S1DS. Quantitative and qualitative studies of the literature and citations of the work of the scientists considered to be responsible for the new paradigm are used to describe the revolution.

? Roche, M. (1983), Sciences and cultures - Mendelsohn, E, Elkana, Y. *Scientometrics*, **5** (5), 329-331.

Full Text: [1983\Scientometrics5, 329.pdf](1983/Scientometrics5,%20329.pdf)

? Kochen, M. (1983), The cognitive paradigm: Demey, M. *Scientometrics*, **5** (5), 331-333.

Full Text: [1983\Scientometrics5, 331.pdf](1983/Scientometrics5,%20331.pdf)

? Rajeswari, A.R. (1983), A quantitative-analysis of indian science and technology manpower employment and economic-development. *Scientometrics*, **5** (6), 343-359.

Full Text: [1983\Scientometrics5, 343.pdf](1983/Scientometrics5,%20343.pdf)

Abstract: In this paper an attempt has been made to analyse the science & technology (simply S & T) manpower employment in relation to economic development based on quantitative analysis. The results derived from various analyses have shown the existence of correlation between S & T employment generation and economic development. A number of multiple regression analyses have indicated in quantitative terms the extent of growth expected in the Gross National Product (GNP), industrial output and R & D expenditure to absorb the available supply of S & T personnel.

? Midorikawa, N. (1983), Citation analysis of physics journals: Comparison of subfields of physics. *Scientometrics*, **5** (6), 361-374.

Full Text: [1983\Scientometrics5, 361.pdf](1983/Scientometrics5,%20361.pdf)

Abstract: In this study, half-life, citation degree, form dispersion and title dispersion of physic journals were investigated, and they were compaired in each subfield with those in other subfields.

The results from this study were that, on the whole, in physics the most preferred medium for physicists is the ‘journal’, however, in the subfields in which large experimental or observational devices are used, the use of ‘reports’ and ‘letter journals’ is going to increase.

? Haitun, S.D. (1983), The “rank distortion” effect and non-gaussian nature of scientific activities. *Scientometrics*, **5** (6), 375-395.

Full Text: [1983\Scientometrics5, 375.pdf](1983/Scientometrics5,%20375.pdf)

Abstract: The “rank distortion” of statistical distribution and its effect on the non-Gaussian nature of scientific activities is discussed. Examples are presented and in particular, the dispersion of publications by journals (the Bradford distribution) is discussed in detail. The data supporting the thesis of non-Gaussian nature of science are reexamined, and the empirical basis of the thesis is extended.

? Schubert, A. (1983), Quantitative studies of science: A current bibliography. *Scientometrics*, **5** (6), 397-403.

Full Text: [1983\Scientometrics5, 397.pdf](1983/Scientometrics5,%20397.pdf)

? Eisemon, T. (1983), The manufacture of knowledge: An essay on the constructivist and contextual nature of science - Knorrcetina, KD. *Scientometrics*, **5** (6), 405-406.

Full Text: [1983\Scientometrics5, 405.pdf](1983/Scientometrics5,%20405.pdf)

? Moravcsik, M.J. (1983), Science in context: Barnes, B, Edge, D. *Scientometrics*, **5** (6), 406-407.

Full Text: [1983\Scientometrics5, 406.pdf](1983/Scientometrics5,%20406.pdf)

? Griffith, B.C. (1984), Price, D (1922-1983) and the social-studies of science. *Scientometrics*, **6** (1), 5-7.

Full Text: [1984\Scientometrics6, 5.pdf](1984/Scientometrics6,%205.pdf)

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Full Text: [1984\Scientometrics6, 9.pdf](1984/Scientometrics6,%209.pdf)

Abstract: A susceptibility parameter called the ‘intelligence constant’ by which it is possible to assess the complexity of scientific research in the different periods in history is suggested. In scientific sense, the intelligence constant measures creative energy expended in the achievement of a major scientific result. It is demonstrated that the sudden change of intelligence constant signalizes a scientific revolution and so the law of intelligence constant change might provide a particular method to forecast scientific revolutions in the future.

? Qurashi, M.M. (1984), Publication rate as a function of the laboratory group-size. *Scientometrics*, **6** (1), 19-26.

Full Text: [1984\Scientometrics6, 19.pdf](1984/Scientometrics6,%2019.pdf)

Abstract: In view of conflict with the conclusions of several earlier studies, a fresh analysis has been made of *Cohen’s* data on publication-rate for various lab. group sizes in the National Cancer Institute (USA) and the National Institute of Medical Research (U.K.) for 1976-77. The present analysis is based on subdividing the data into successive ranges of lab. Group size, 1-3, 4-6, 7-9., .and calculating the relevant publication rate person (R) for each range.

When plotted, this yields graphs with an *initial* linear rise of per-capita publication rate, R, followed by well-marked maxima of publication rates (maxima/minima N1.6) at group size of 6,16, and 27 • persons, which are confirmed through analyses with ranges of two different group sizes. The group size at the peaks presumably correspond to optimum efficiency, in general agreement with the findings of the present author on samples from various countries published several years ago. Our conclusions fall somewhere between the findings of *Cohen* (publication rate independent of size) and those of *lCallmark* et al. (research efficiency increases exponentially with size).

? Cohen, J.E. (1984), Statistical theory AIDS inference in scientometrics Comments to publication rate as a function of the laboratory/group size by M. M. Qurashi. *Scientometrics*, **6** (1), 27-32.

Full Text: [1984\Scientometrics6, 27.pdf](1984/Scientometrics6,%2027.pdf)

Keywords: Scientometrics

? Hopkins, F.L. (1984), New causal theory and ethnomethodology: Cocitation patterns across a decade. *Scientometrics*, **6** (1), 33-53.

Full Text: [1984\Scientometrics6, 33.pdf](1984/Scientometrics6,%2033.pdf)

Abstract: Twenty-one authors were selected from Nicholas *Mullins’* 1972 lists of leaders in two emergent sociological theory groups, new causal theory and ethnomethodology. Data on cocitation of their works for the periods 1972-1976 and 1977-1981 were extracted from the *Social Scisearch* database and subjected to factor analysis and multidimensional scaling programs. Interpretation of the results, based on examination of a sample of the cited literature, confirmed Mullins’ division of these authors into two distinct groups. The evidence indicates that ethnomethodology is neither dying out nor becoming more alienated from mainstream sociology.

? Schubert, A. (1984), Quantitative studies of science: A current bibliography. *Scientometrics*, **6** (1), 55-59.

Full Text: [1984\Scientometrics6, 55.pdf](1984/Scientometrics6,%2055.pdf)

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Full Text: [1984\Scientometrics6, 61.pdf](1984/Scientometrics6,%2061.pdf)

? Baldauf, R.B. (1984), Correction. *Scientometrics*, **6** (1), 67.

Full Text: [1984\Scientometrics6, 67.pdf](1984/Scientometrics6,%2067.pdf)

? Moravcsik, M.J. (1984), Life in a multidimensional world. *Scientometrics*, **6** (2), 75-85.

Full Text: [1984\Scientometrics6, 75.pdf](1984/Scientometrics6,%2075.pdf)

Abstract: The methodology of the science of science is claimed to be plagued by one-dimensional thinking, and it is urged that a multi-dimensional view be adopted instead. In a onedimensional model ‘cause’ is a meaningful word, superlatives Can be used, dichotomous thinking is realistic, with a resultant ‘zero-sum’ mentality, and the ‘make a hypothesis - find a correlation’ method makes sense. In the multidimensional framework these four characteristics are unsuitable, and instead a quite different set of questions arise as appropriate. This is illustrated on five examples taken from among currently interesting questions in the science of science. Following some remarks about simplicity and about the role and limitations of multiple regression analyses, it is concluded that, among other things, more purely phenomenological studies are needed to make progress in the science of science.

? Gordon, M.D. (1984), Methodological pluralism in a multidimensional world: A comment to the special report. *Scientometrics*, **6** (2), 87-92.

Full Text: [1984\Scientometrics6, 87.pdf](1984/Scientometrics6,%2087.pdf)

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Full Text: [1984\Scientometrics6, 93.pdf](1984/Scientometrics6,%2093.pdf)

? Frame, J.D. (1984), Multidimensionality is alive and well in applied statistics: A comment to the special report. *Scientometrics*, **6** (2), 97-101.

Full Text: [1984\Scientometrics6, 97.pdf](1984/Scientometrics6,%2097.pdf)

? Nalimov, V.V. (1984), Life in a multidimensional world: A comment to the special report. *Scientometrics*, **6** (2), 103-104.

Full Text: [1984\Scientometrics6, 103.pdf](1984/Scientometrics6,%20103.pdf)

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Full Text: [1984\Scientometrics6, 105.pdf](1984/Scientometrics6,%20105.pdf)

? Sengupta, I.N. (1984), The place of phenomenological studies in scientometrics: A comment to the special report. *Scientometrics*, **6** (2), 109-113.

Full Text: [1984\Scientometrics6, 109.pdf](1984/Scientometrics6,%20109.pdf)

Keywords: Scientometrics

? Hurt, C.D. (1984), An examination of the literature distributions of 3 scientific specialties. *Scientometrics*, **6** (2), 115-126.

Full Text: [1984\Scientometrics6, 115.pdf](1984/Scientometrics6,%20115.pdf)

Abstract: An examination was conducted of the distributions produced by historical treatments of three scientific specialties: quantum mechanics, plate tectonics, and endocrinology. A citation analysis approach was employed to generate a frequency distribution for year of publication of literature referenced by historians. The observed values were normalized and tested for goodness of fit to each other using a Pearson goodness of fit test. The results indicated that the three distributions were not equivalent. Other parameters of the three distributions did show similarities using a *Dunn* planned comparison approach. The skewness of the three distributions was very similar and plate tectonics and endocrinology were similar in terms of kurtosis. The major conclusion reached was that there were major differences in the three distributions but some similarities in particular parameters were evident. Additional work is necessary to determine causal factors for the differences as well as similarities.

? Todorov, R. (1984), Determination of influence weights for scientific journals: An example from elementary particle physics. *Scientometrics*, **6** (2), 127-138.

Full Text: [1984\Scientometrics6, 127.pdf](1984/Scientometrics6,%20127.pdf)

Abstract: A new citation matrix is proposed for the computation of journal influence weights applying Gelter’s methodology. Instead of self-citations, references to fringe journals are introduced and the proportions of all references (without self-citations) are used as matrix elements. On the basis of the determined weights, relative weights for fringe journals are calculated, i.e. the initial set (core) of journals is extended and simultaneously a rank order is obtained (by total influence and influence per article). The procedure is examplified on elementary particle physics (EPP) journals. Using first a reference/citation criterion, eight core journals were determined by iteration and then influence weights were calculated. A ranking by total influ6nce and influence per article is presented for core and fringe journals in EPP.

? Schubert, A. and Glänzel, W. (1984), A dynamic look at a class of skew distributions: A model with scientometric applications. *Scientometrics*, **6** (3), 149-167.

Full Text: [1984\Scientometrics6, 149.pdf](1984/Scientometrics6,%20149.pdf)

Abstract: A theoretical model of repetitive events is presented and applied to the scientific publication process. Based on three simple postulates, a relation between population growth and distribution of authors by publication productivity in a scientific community is established. Predictions of the model are supported by empirical evidences.

? Simonton, D.K. (1984), Scientific eminence historical and contemporary: A measurement assessment. *Scientometrics*, **6** (3), 169-182.

Full Text: [1984\Scientometrics6, 169.pdf](1984/Scientometrics6,%20169.pdf)

Abstract: In some studies of scientific creativity it has proved useful to assess the differential eminence of scientists according to their presence in historical record (as registered by scholarly works). To determine the research utility of such indicators, a sample of 2026 scientists spanning several centuries and nationalities was taken from three biographical dictionaires of science. The eminence of each scientist was gauged 23 distinct ways using a diversity of reference works (e.g., histories, biographical dictionaires, encyclopedias, etc.) and variable operationalizations (e.g., space measures, ratings, rankings, etc.). Despite minor discrepancies due mainly to the degree of timewise bias and reference work type, a factor analysis demonstrated the existence of a pervasive concensus. A linear composite of these measures had an c~ reliability of 0.78. Further, it was shown that (a) the reliability of assessed eminence somewhat declines as it is applied to more recently born scientists, (b) the reliability remains high within separate disciplines and nationalities, and (c) assessed eminence, once complex time trends are controlled, correlates positively with the more commonly used citation counts, especially the number of cited publications. Hence, archival indicators or’ scientific eminence axe both reliable and consistent with other scientometric procedures.

? Eto, H. (1984), Bradford Law in R and D expending of firms and R and D concentration. *Scientometrics*, **6** (3), 183-188.

Full Text: [1984\Scientometrics6, 183.pdf](1984/Scientometrics6,%20183.pdf)

Abstract: The applicability of the Bradford law 1o the R ~ D expending of firms is examined and its usefidness is proved. It successfully identifies core firms, peripheral firms and minor firms. It also provides a measure to evaluate the degree of R & D concentration lo a small number of firms.

? Diamond, A.M. (1984), An economic-model of the life-cycle research productivity of scientists. *Scientometrics*, **6** (3), 189-196.

Full Text: [1984\Scientometrics6, 189.pdf](1984/Scientometrics6,%20189.pdf)

Abstract: Scientific productivity is constant as a scientist ages according to recent studies relying mainly on quantity measures of productivity. An economic model of the life-cycle productivity of scientists is presented which implies that the number of citations made to a scientist’s previous work will decline with age. The implication could be consistent with the finding of constant quantity output with age if the decline in quality (as measured by number of citations per article) is large enough.

? Schubert, A. (1984), Quantitative studies of science: A current bibliography. *Scientometrics*, **6** (3), 197-202.

Full Text: [1984\Scientometrics6, 197.pdf](1984/Scientometrics6,%20197.pdf)

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Full Text: [1984\Scientometrics6, 203.pdf](1984/Scientometrics6,%20203.pdf)

? Nalimov, V.V. (1984), Scientometrics - State and prospects - Russian - Haitun, SD. *Scientometrics*, **6** (3), 204-205.

Full Text: [1984\Scientometrics6, 204.pdf](1984/Scientometrics6,%20204.pdf)

Keywords: Scientometrics

? Snizek, W.E. (1984), Casting the 1st rock: Some observations on the bestowers and recipients of journal article comments in sociology. *Scientometrics*, **6** (4), 215-222.

Full Text: [1984\Scientometrics6, 215.pdf](1984/Scientometrics6,%20215.pdf)

Abstract: This study examines the patterns of evaluation surrounding journal article comments which have appeared in the *ASR* from 1970 through 1979. The data analyzed represent a complete enumeration of the demographic and prestige characteristics of 560 senior authors of articles, and 172 authors of comments written on 138 of the 560 articles published during the decade. Upon comparison, authors whose articles have been commented on are shown to be affiliated with significantly less prestigious institutions, than are authors whose articles have not been commented on. Furthermore, a significant inverse relationship is shown to exist between the academic ranks of article authors and comment writers.

? Frame, J.D. (1984), Quantitative management of technology. *Scientometrics*, **6** (4), 223-232.

Full Text: [1984\Scientometrics6, 223.pdf](1984/Scientometrics6,%20223.pdf)

Abstract: The paper examines a not too comprehensive set of quantitative aspects of technology. It concentrates mainly on the quantification of management tools.

? Karmeshu, Lind, N.C. and Cano, V. (1984), Rationales for Bradford Law. *Scientometrics*, **6** (4), 233-241.

Full Text: [1984\Scientometrics6, 233.pdf](1984/Scientometrics6,%20233.pdf)

Abstract: Two models of the mechanism responsible for the distribution of scientific papers in an area over periodicals are given. Empirical distributions following Bradford’s law are shown to agree quite closely with a lognonnal distribution. This distribution arises, in one model, by taking the probability of a paper being published in a particular journal as the product of many independent factors It can also arise, according to an alternative mechanism, by random subdivision of the papers in a field over the journals. The mechanisms are compared with other models in the literature.

? Lerner, J. and Roy, R. (1984), Numbers, origins, economic value and quality of technically trained immigrants into the United-States. *Scientometrics*, **6** (4), 243-259.

Full Text: [1984\Scientometrics6, 243.pdf](1984/Scientometrics6,%20243.pdf)

Abstract: This study updates the data on the numbers and the changing origins of immigrants into the U.S. with technical qualifications and ability, and the economic gain to the U.S. therefrom. It also provides new data on the quality of such personnel by examining the number of immigrants who are elected to the U.S. National Academies of Engineering and of Science, and also win Nobel prizes. It is shown that this immigration is a major continuing contribution to the U.S., constituting substantial fractions (one third to one-half) of certain categories of advanced degrees. Using different methods of calculating the value of the education thus transferred one arrives at the general conclusion that it is roughly in balance with the total economic aid from the U.S. (i.e. in the order of several billion i/year in the last two decades). Immigrant engineers/scientists constitute about a fifth of National Academy membership and between 20 and 50% of the Nobel prize winners, depending on the discipline involved, with chemistry appearing as the native national strength of the U.S.

Keywords: United States

? Gieryn, T.F. (1984), Polish contributions to the science of science: Walentynowicz, B. *Scientometrics*, **6** (4), 261-262.

Full Text: [1984\Scientometrics6, 261.pdf](1984/Scientometrics6,%20261.pdf)

? Moravscik, M.J. (1984), Sociology of sciences: An annotated-bibliography on invisible-colleges, 1972-81 - Chubin, DE. *Scientometrics*, **6** (4), 263.

Full Text: [1984\Scientometrics6, 263.pdf](1984/Scientometrics6,%20263.pdf)

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Full Text: [1984\Scientometrics6, 264.pdf](1984/Scientometrics6,%20264.pdf)

? Pyenson, L. and Singh, M. (1984), Physics on the periphery: A world survey, 1920-1929. *Scientometrics*, **6** (5), 279-306.

Full Text: [1984\Scientometrics6, 279.pdf](1984/Scientometrics6,%20279.pdf)

Abstract: We provide a quantitative, historical survey of physics on the periphery (that is, beyond Europe and the United States) during the crucial decade of the I920s. Our population derives from Henry mall’s *Physics Citation Index~ 1920-1929,* 2 vols (Philadelphia, 1981), which organizes the content of sixteen of the world:s most important physics journals into the alphabetical lists familiar to users of the products of the Institute for Scientific Information. The 319 authors are situated in eleven separate political entities. Both expected and surprising results emerge from considering the educational trajectories, publishing patterns, and citation visibility of our sample.

? Gregory, J.G. (1984), Citation study of a scientific revolution: Sudden infant death syndrome. 2. The superseded paradigm. *Scientometrics*, **6** (5), 307-326.

Full Text: [1984\Scientometrics6, 307.pdf](1984/Scientometrics6,%20307.pdf)

Abstract: Nutrition hypotheses associated with the old paradigm for the cause of sudden infant death syndrome (SIDS) have been investigated by a qualitative and quantitative analysis of citations It is shown that they are reasonable and that they have not definitely been refuted, but that interest in them has declined. The social and political background of infant feeding is outlined, and the scientific revolution is discussed in relation to Kuhn’s precepts and external influences on the course of research.

Poikolainen, K. (1984), Organization and funding of medical-research in 10 European-countries. *Scientometrics*, **6** (5), 327-358.

Full Text: [1984\Scientometrics6, 327.pdf](1984/Scientometrics6,%20327.pdf)

Abstract: Information on the organization and funding of medical research were obtained by a questionnaire from 10 member countries of the European Medical Research Councils. Responses how that the ratio of medical research expenditure to Gross Domestic Product varied from 0.1 to 0.2 per cent between these countries. In many countries, the largest shtgle source of funds was pharmaceutical industry, its share of the total expenditure varied between one and 58 per cent. Excluding pharmaceutical industry, the contribution of Medical Research Councils (MRCs) varied from 2 to 22 per cent of the remaining expenditure- The present figures, derived directly from the national research organizations, were considerably higher than the respective OECD figures. A great deal of variation between the national MRCs in the distribution of funds by field of research, type of activity, and type of cost was observed. The average cost era research project varied between 4800-97000 U.S. dollars. The variation is probably explained to a great extent by availability of other sources of funds. All MRCs used peer review in the assessment of research proposals. Criteria for peer review varied much. Only two MRCs mentioned specifically the needs of the society among the criteria. The various medical research organizations are described in detail inthis report.

? Schubert, A. (1984), Quantitative studies of science: A current bibliography. *Scientometrics*, **6** (5), 359-367.

Full Text: [1984\Scientometrics6, 359.pdf](1984/Scientometrics6,%20359.pdf)

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Full Text: [1984\Scientometrics6, 369.pdf](1984/Scientometrics6,%20369.pdf)

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Full Text: [1984\Scientometrics6, 381.pdf](1984/Scientometrics6,%20381.pdf)

Abstract: To analyze developments in scientific fields, scientometrics provides useful tools, provided the content of scientific articles is taken into account. Such cognitive scientometrics is illustrated by using as data a 10-yr period of articles from a biotechnology core journal. After coding with key words, the relations between articles are brought out by co-word analysis. Maps of the field are given, showing connections between areas and their change over time, and with respect to the institutions in which research is performed. Other approaches are explored, including an indicator of theoretical level of bodies of articles.

Keywords: Biotechnology, Scientometrics

? Studer, K.E., Barboni, E.J. and Numan, K.B. (1984), Structural-analysis using the input-output model: With special reference to networks of science. *Scientometrics*, **6** (6), 401-423.

Full Text: [1984\Scientometrics6, 401.pdf](1984/Scientometrics6,%20401.pdf)

Abstract: Social science network analysis originated in the small group sociometric tradition, thus many of the common assumptions of network models are inappropriate theoretically and formally for the analysis of open systems of social relationships. Five common assumptions of network analysis are identified, discussed and criticized: (a) generators are homogeneous, (b) relationships are dichotomous, (c) groups have fixed boundaries, (d) relationships are symmetric, and (e) networks are static. It is suggested that an open input-output model overcomes many of the difficulties inherent in the more common network analytical techniques. After a formal treatment of input-output analysis, and its relationship to network analysis, some interpretations from exchange theory are suggested. This model helps the analyst overcome many of the theoretical difficulties encountered in other models and allows the researcher to specify how subsets of individuals are ‘embedded’ within larger social contexts. Specifically, because society is comprised of numerous interacting subsystems, this model is particularly beneficial in describing how groups of scientists interface with each other and with the larger social domains.

? Richards, Jr., J.M. (1984), Structure of specialization among American population scientists. *Scientometrics*, **6** (6), 425-432.

Full Text: [1984\Scientometrics6, 425.pdf](1984/Scientometrics6,%20425.pdf)

Abstract: Studies of journal citation patterns suggest that specialty areas within disciplines may be the most appropriate structural units for understanding the social organization of science. Citation studies necessarily are limited to scientists who publish, however, and studies of all members of particular disciplines would provide more general specialty structure data. Accordingly, this research applied factor analytic procedures previously used in studies of the structure of specialization among psychologists to all members of the Population Association of America. Four principal components derived from the self-designated specialties of these population scientist were rotated to a final solution by the varimax procedure and were interpreted as measuring, respectively, *Social Emphasis, Geographic Emphasis, Formal Emphasis,* and *Epidemiological Emphasi~* These results partially confirm the distinction sometimes made by population scientists between social demography and formal demography, but suggest this typology is incomplete. The results also illustrate techniques that could provide a useful alternative to citation analysis for researchers studying specialty s~uctures in other disciplines.

? Schubert, A., Zsindely, S., Telcs, A. and Braun, T. (1984), Quantitative-analysis of a visible tip of the peer-review iceberg: Book reviews in chemistry. *Scientometrics*, **6** (6), 433-443.

Full Text: [1984\Scientometrics6, 433.pdf](1984/Scientometrics6,%20433.pdf)

Abstract: Book reviews are practically unique in being public, ‘visible’ manifestations of the peer review process. Two hundred reviews of 39 books on chemical topics were subjected to statistical context analysis. Dominance of attitudes, consensus among reviewers, correlation between the reviewers’ evaluations and the subsequent citation rate of the reviewed book were analysed.

? Schubert, A. (1984), The visual-display of quantitative information: Tufte, ER. *Scientometrics*, **6** (6), 445-446.

Full Text: [1984\Scientometrics6, 445.pdf](1984/Scientometrics6,%20445.pdf)

? Moravcsik, M.J. (1984), Would we be better off without research: The influence of natural-science on society - German - Perutz, MF. *Scientometrics*, **6** (6), 446-447.

Full Text: [1984\Scientometrics6, 446.pdf](1984/Scientometrics6,%20446.pdf)

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Full Text: [1984\Scientometrics6, 447.pdf](1984/Scientometrics6,%20447.pdf)

? (1984), Indicators of measurement of impact of science and technology on socio-economic development objectives: Report of the panel of specialists of the united-nations-advisory-committee-on-science-and-technology-for-developm ENT held in Graz, Austria from 2-7 May 1984. *Scientometrics*, **6** (6), 449-463.

Full Text: [1984\Scientometrics6, 449.pdf](1984/Scientometrics6,%20449.pdf)

Keywords: Austria

? Oromaner, M. (1985), The ortega hypothesis and influential articles in American sociology. *Scientometrics*, **7** (1-2), 3-10.

Full Text: [1985\Scientometrics7, 3.pdf](1985/Scientometrics7,%203.pdf)

Abstract: In The *Revolt of the Masses,* Jose *Ortega y Gasset* suggests that the work of average or mediocre researchers plays a role in the advancement of science. In order to examine the ‘Ortega hypothesis’ in sociology, lifework citations to scholars referred to in 5 of the most highly cited contemporary sociological articles are examined. The findings do not support the hypothesis. That is, few average scholars received citations to their work in these influential articles. This finding is consistent with similar analyses for physics and criminology.

? Bakker, P. and Rigter, H. (1985), Editors of medical journals: Who and from where. *Scientometrics*, **7** (1-2), 11-22.

Full Text: [1985\Scientometrics7, 11.pdf](1985/Scientometrics7,%2011.pdf)

Abstract: The representation of scientists from different countries in the editorial boards of the most influential journals from 48 fields of biomedical and clinical research was studied. Scientists from the USA were best represented, followed by scientists from the UK, FRG, Switzerland, Japan, Sweden, Canada, The Netherlands and Italy. The scientifically most productive countries provided most of the editors. For Dutch editors a strong correlation wa~ found between the number of editorships held and the number of papexs--~trth~-r~d or measures of scientific eminence. Conceivably, scientific productivity and eminence may be important reasons for being asked as an editor. However, national biases play a role too in the composition of editorial boards.

? Nederhof, A.J. (1985), Evaluating research output through life work citation counts. *Scientometrics*, **7** (1-2), 23-28.

Full Text: [1985\Scientometrics7, 23.pdf](1985/Scientometrics7,%2023.pdf)

Abstract: The total number of citations to all previous publications (‘the life work’ has often been used to evaluate the research output of target units such as persons or depa\_qments. However, a study of a sample of Dutch full professors of sociology shows that simple counting of citations may lead to unretiable results. Dependent upon recency of publication period, large variations in rankings and citation scores were observed. Other pitfalls of using life work citation counts were discussed, as well as how to avoid them. For fine-tuned assessment of research output, longitudinal analysis seems to be called for.

? Leary, R.A. (1985), A Framework for assessing and rewarding a scientists research productivity. *Scientometrics*, **7** (1-2), 29-38.

Full Text: [1985\Scientometrics7, 29.pdf](1985/Scientometrics7,%2029.pdf)

Abstract: A contest for werld leadership in science and technology exists. New ways to motivate scientists seem as important to contest outcome as new sources of funds. A framework formed by cross-tabulating question difficulty and answer generality should help to identify the contribution of a research scientist, A reward relationship based on this framework should help to ensure that scientists will work on the most difficult research problems, a necessity for a high quality research program.

? Kretschmer, H. (1985), Cooperation structure, group-size and productivity in research groups. *Scientometrics*, **7** (1-2), 39-53.

Full Text: [1985\Scientometrics7, 39.pdf](1985/Scientometrics7,%2039.pdf)

Abstract: A research group is considered to be a system and the scientists the elements in this system. The degree of interaction among scientists is determined by means of a complex structure measure for groups. It is shown that optimum cooperation structures depend on group size. In addition, it was possible to determine an optimum group size. Various hypotheses have been verified employing the same data material by using several levels of the structure measure.

? Mcallister, P.R. and Condon, T. (1985), Econometric-analysis of biomedical-research publishing patterns. *Scientometrics*, **7** (1-2), 55-75.

Full Text: [1985\Scientometrics7, 55.pdf](1985/Scientometrics7,%2055.pdf)

Abstract: An econometric-type model was developed that describes the relationship between federal biomedical funding and the number, subject area and research level (clinical to basic) of published papers in biomedical journals. The study covered federal biomedical funding over the period 1962-1979 and biomedical literature counts over the period 1965-1979. A unique feature of the model was the explicit incorporation of the citation-based interrelationships among the various subfields and research levels of biomedicine. Publication counts in a particular subject area were modeled as a function of federal funding to the area and publication activity in related subject areas. In general, publication activity in related subject areas was found to be a significant explanatory variable over and above funding alone. Moreover, clinically oriented subject areas most often had publication counts in related basic research areas as explanatory variables.

? Pavitt, K. (1985), Patent statistics as indicators of innovative activities: Possibilities and problems. *Scientometrics*, **7** (1-2), 77-99.

Full Text: [1985\Scientometrics7, 77.pdf](1985/Scientometrics7,%2077.pdf)

Abstract: Advances in information technology have increased actual and potential uses of patent statistics as proxy measures of innovative activitie~ Analytical contributions have come out of economics, bibliometrics, and descriptive comparisons for policy purposes. They show achievement of promise in analysing (1) international patterns of innovative activities and their effects on trade and production, (2) patterns of innovative activities amongst firms, and their effects on firm performance and industrial structure, (3) rates and directions of innovative activities in different technical fiieds and industrial sectors, (4) links between science and technology. However, systematic biases remain in patent statistics, the full assessment of which require further econometric, classificatory and survey research.

? Balog, C. (1985), The distribution of reference citations in 2 agricultural journals. *Scientometrics*, **7** (1-2), 101-104.

Full Text: [1985\Scientometrics7, 101.pdf](1985/Scientometrics7,%20101.pdf)

Abstract: The average numbers of references cited in papers published *in N. Z. Journal of Experimental Agriculture (.YEA/*and *N. Z. Journal of Agricultural Research (JAR) are* compared. The papers in *JAR* have a greater number of references per paper than do,*YEA* papers, probably because *.YAR* papers are longer. For *.YEA* papers there is a steady increase in the average number of references per paper as the number of authors per paper increases. F0r *.YAR* there is no such steady increase but there is a marked increase in the average number of references per paper for 3- and 4+-author papers There is a clear difference between.yEA and *JAR* papers in the distribution of references between the different sections of the text. For *.YEA* papers 49% of references are cited in the Introduction and 52% are cited in the Results & Discussion sections For *JAR* the f~gures are 38% and 65% respectively. It is suggested that the distribution of cited references in the different sections of the text may be an indicator of the ‘apptiedness’ of a paper or of a journal.

? Balog, C. (1985), Authorship of papers dealing with different subjects in an agricultural journal. *Scientometrics*, **7** (1-2), 105-109.

Full Text: [1985\Scientometrics7, 105.pdf](1985/Scientometrics7,%20105.pdf)

Abstract: It has been shown 2 that there is little change in the subject areas covered by papers published inN. Z. *Journal of Agricultural Research* from 1958 to 1978. Over the same period there has been a marked increase in the number of multiple author paperspublished in the same journal (See Ref. 1). It was considered possible that the subjects covered by single and multiple author papers could be different but these differences could be masked by the changes in multiple authorship over the 21 years from 1958 to 1978. This paper considers the subject areas of papers published *in N. Z. Journal of Agricultural Research* over the years 1958 (volume 1) to 1978 (volume 21) and compares single and multiple author papers.

? Schubert, A. (1985), Quantitative studies of science: A current bibliography. *Scientometrics*, **7** (1-2), 111-117.

Full Text: [1985\Scientometrics7, 111.pdf](1985/Scientometrics7,%20111.pdf)

? Moravcsik, M.J. (1985), The arab construction-industry: Zahlan, AB. *Scientometrics*, **7** (1-2), 119-120.

Full Text: [1985\Scientometrics7, 119.pdf](1985/Scientometrics7,%20119.pdf)

? Medows, J. (1985), How to write and publish a scientific paper: Day, RA. *Scientometrics*, **7** (1-2), 120-121.

Full Text: [1985\Scientometrics7, 120.pdf](1985/Scientometrics7,%20120.pdf)

? (1985), Price, Derek, John, Desolla memorial issue: Instead of a preface. *Scientometrics*, **7** (3-6), 137.

Full Text: [1985\Scientometrics7, 137.pdf](1985/Scientometrics7,%20137.pdf)

Moravcsik, M.J. (1985), Address at the presentation of the first Derek de Solla Price Award to Eugene Garfield on December 20, 1984. *Scientometrics*, **7** (3-6), 143-144.

Full Text: [1985\Scientometrics7, 143.pdf](1985/Scientometrics7,%20143.pdf), [1985\Scientometrics7, 143a.pdf](1985/Scientometrics7,%20143a.pdf)

? Marton, J. (1985), Obsolescence or immediacy: Evidence supporting price hypothesis. *Scientometrics*, **7** (3-6), 145-153.

Full Text: [1985\Scientometrics7, 145.pdf](1985/Scientometrics7,%20145.pdf)

Abstract: The time distributions of references given by five leading journals in each of seven life science disciplines revealed that the decrease in the frequency of references is faster in the early years (5-10 years) than later. The rate of decrease is in good correlation with the 3 and 4 year-old references per article values, with the discipline impact factor sums and with the ratio of the 3-year-old references to the 4-year-old ones. The results are discussed as evidence supporting *Price’s* immediacy factor, i.e. the fall of citations in time does not mean obsolescence.

? Schubert, A., Zsindely, S. and Braun, T. (1985), Scientometric indicators for evaluating medical-research output of mid-size countries. *Scientometrics*, **7** (3-6), 155-163.

Full Text: [1985\Scientometrics7, 155.pdf](1985/Scientometrics7,%20155.pdf)

Abstract: The medical research output of eleven mid-size countries were compared with the aid of scientometric indicators. Papers published by clinical medicine journals and those of professors working at clinical faculties were used for comparison. The professors proved to be more productive authors than ‘average scientists’ of the same country, but no particular eminence of the professors could be revealed. A correlation was found between the quality of clinical medicine papers (as reflected by their relative citation rate) and the infant mortality of the countries in question.

? Moravcsik, M.J. (1985), Applied scientometrics: An assessment methodology for developing-countries. *Scientometrics*, **7** (3-6), 165-176.

Full Text: [1985\Scientometrics7, 165.pdf](1985/Scientometrics7,%20165.pdf)

Abstract: A United Nations sponsored project is described to formulate a practicable method for assessing the impact of science and technology in the developing countries and to propose further research to improve the development of such indicators. After a discussion of the importance of the project, the aims of science and technology are summarized, followed by the elements that need to be considered in such an assessment procedure, and the structure of the relationships among these elements. The first step in the assessment process is to make a map of the part of the system to be assessed. The types of indicators that can be used are then listed, and it is suggested that the status of these indicators is weak, especially with respect to their applicability to developing countries. It is proposed that a small number of specific pilot projects be undertaken to test the general ideas contained in the discussion and to experiment with novel kinds of indicators.

Keywords: Scientometrics

? Stefaniak, B. (1985), Periodical literature of information science as reflected in referativnyi zhurnal section 59 informatika. *Scientometrics*, **7** (3-6), 177-194.

Full Text: [1985\Scientometrics7, 177.pdf](1985/Scientometrics7,%20177.pdf)

Abstract: The paper presents results of a study of information science periodical literature included into RZh-Informatika in 1977-1983. The distribution of papers among periodicals and their language pattern are shown. The list of 95 periodicals that rendered at least 12 papers yr is also presented. The results are compared with some data taken from the SSCI-JCR database. Connections between information science and scientometerics are investigated by the overlap of periodical literature in both fields.

? Todorov, R. (1985), Distribution of Physics Literature. *Scientometrics*, **7** (3-6), 195-209.

Full Text: [1985\Scientometrics7, 195.pdf](1985/Scientometrics7,%20195.pdf)

Abstract: Percentage distributions of physics papers in 36 countries over ten subfields are compared. Factor and cluster analyses are applied to data from 1978 *Physics Abstracts.* Countries load highly on seven factors. Their meaning~s estimated by factor scores. Clusters of countries with similar publishing patterns are presented in a tree diagram.

? Glänzel, W. and Schubert, A. (1985), Price distribution: An exact formulation of price square root law. *Scientometrics*, **7** (3-6), 211-219.

Full Text: [1985\Scientometrics7, 211.pdf](1985/Scientometrics7,%20211.pdf)

Abstract: An exact probabilistic formulation of the ‘square root law’ conjectured by *Price* is given and a probability distribution satisfying this law is defined, for which the name *Price distribution* is suggested. Properties of the *Price* distribution are discussed, including its relationship with the laws of *Lotka* and *Zipf.* No empirical support of applicability *of Price* distribution as a model for publication productivity could be found.

? Chubin, D.E. (1985), Beyond invisible-colleges: Inspirations and aspirations of post-1972 social-studies of science. *Scientometrics*, **7** (3-6), 221-254.

Full Text: [1985\Scientometrics7, 221.pdf](1985/Scientometrics7,%20221.pdf)

Abstract: An exact probabilistic formulation of the ‘square root law’ conjectured by *Price* is given and a probability distribution satisfying this law is defined, for which the name *Price distribution* is suggested. Properties of the *Price* distribution are discussed, including its relationship with the laws of *Lotka* and *Zipf.* No empirical support of applicability *of Price* distribution as a model for publication productivity could be found.

? Long, J.S. and Mcginnis, R. (1985), The effects of the mentor on the academic career. *Scientometrics*, **7** (3-6), 255-280.

Full Text: [1985\Scientometrics7, 255.pdf](1985/Scientometrics7,%20255.pdf)

Abstract: The mentor plays an important role in initiating a process of cumulative advantage for the student. Our analyses present a c/ear and systematic pattern of effects of the mentor on the careers of biochemists. The influence of the mentor begins with collaboration, which is the single most important factor affecting the student’s predoctoral productivity. For those who collaborate, the effects of both eminence and performance further increase the student’s predoctoral productivity. The mentor’s performance has weak effects on the productivity of noncollaborating students. For those who collaborate with their mentor, the mentor continues to influence the careerwith a positive effect of the mentor’s performance on academic placement, an effect not found for noncollaborators. Even though the mentor’s performance affects the student’s placement, the student’s performances does *not* affect that placement, suggesting a process of ascription. For those who collaborate with their mentor, the mentor’s performance increases the student’s later publications and citations. For noncollaborators, whose mentors are much less productive during the student’s period of doctoral study, the mentor’s eminence has a smaUer, but significant effect on later productivity. Overall, the advantages of a strong mentor are drawn upon and enhanced through processes of both achievement and ascription.

? Irvine, J. and Martin, B.R. (1985), Evaluating big science: Cerns past performance and future-prospects. *Scientometrics*, **7** (3-6), 281-308.

Full Text: [1985\Scientometrics7, 281.pdf](1985/Scientometrics7,%20281.pdf)

Abstract: After explaining the reasons why science policy-makers face a growing need for more rigorous forms of research evaluation, we outline an approach combining bibliometric and peer-evaluation data that has been developed at the Science Policy Research Unit in the course of a programme of studies of Big Science specialties. The paper describes the results obtained when this ‘method of converging partial indicators’ is applied to compare the past research performance of the accelerators at CERN - the joint European Laboratory for Particle Physics - with that of the world’s other main accelerators. The paper concludes by demonstrating how, on the basis of an analysis of the factors that have structured research performance in the past, it is possible to arrive at a systematic set of conclusions about the future prospects for a major new research facility such as an accelerator.

? Dobrov, G.M. and Tonkal, V.E. (1985), Comparative-analysis and estimation of competence of research units. *Scientometrics*, **7** (3-6), 309-325.

Full Text: [1985\Scientometrics7, 309.pdf](1985/Scientometrics7,%20309.pdf)

Abstract: The UNESCO International Comparative Study on the Organization and Performance of Research Unists (ICSOPRU)\*\* has entered the period of drawing the theoretical and methodological conclusions from and starting the practical application of its results. Based on the experience of the 3 rounds of ICSOPRU, the national team of the Ukrainian SSR has attempted to broaden the scope and methodology of this international project. The main features of our studies are as follows. 1. The comparative analysis is performed among research units working or intending to work on common research topics. 2. The complex characteristics determining the level of competence of the research units in achieving their research aims is evaluated by criteria specific to the given problems. 3. In order to gain the above mentioned results, certain additional material had been included into ‘The National Addendum’ and the national part of ‘External Evaluations Questionnaire’. Some additional software had also been developed)-3 This paper concentrates on some methodological aspects of this approach and refers also to some problems of more intensive use of science and technology.

? Kochen, M. and Lansing, J. (1985), On maps for discovery: Did the periodic table guide elemental discovery. *Scientometrics*, **7** (3-6), 327-339.

Full Text: [1985\Scientometrics7, 327.pdf](1985/Scientometrics7,%20327.pdf)

Abstract: The metaphor of ‘maps’ as cognitive tools aiding scientific discovery may be particularly appropriate for discussing the role of the periodic table of the elements in the progress of chemistry. In a tribute to the contributions *of Derek Price,* the use of maps, their advantages and disadvantages, and changes in the table are explored. The authors conclude that the table did serve as a general guide to discovery but that more insightful models of a different sort also played an important role.

? Mombers, C., Van Heeringen, A., Van Venetië, R. and Le Pair, C. (1985), Displaying strengths and weaknesses in national R-and-D performance through document cocitation. *Scientometrics*, **7** (3-6), 341-355.

Full Text: [1985\Scientometrics7, 341.pdf](1985/Scientometrics7,%20341.pdf)

Abstract: Document cocitation analysis, as developed by Small and Griffith, was employed as a means of assessing current Dutch participation in science. The method compared overall Dutch published contributions to science (1-2%) with the percentage of Dutch papers in both the cited ‘cores’ of clusters and the citing ‘margins’ of clusters (newly published papers). It was possible to identify clusters ranging form ones with strong Dutch participation to those without Dutch cited or citing papers. The method may help policymakers to detect areas of special concern. The technique can be used for any nation, but may be particularly helpful ibr the smaller developed countries. We consider the ide.al distribution of scientific productivity for those countries.

? Mullins, N.C. (1985), Invisible-colleges as science elites. *Scientometrics*, **7** (3-6), 357-368.

Full Text: [1985\Scientometrics7, 357.pdf](1985/Scientometrics7,%20357.pdf)

Abstract: An intensive investigation of the American science advisory system failed to find indications of elite structure in the selection or patterns of service of advisors. Advisory groups cannot act as elements of the invisible college circuits that *Price* refered to. The only long term advisors are *ex officio* members.

Advisory committee growth and activity is marked by three periods: 19.51 to 1957, slow growth, 1957 to 1966, rapid growth, and 1967 to 1972, no growth. Combined with the pattern of growth in numbers of eligible scientists, a perception of elite control may have been created.

? Narin, F. and Noma, E. (1985), Is technology becoming science? *Scientometrics*, **7** (3-6), 369-382.

Full Text: [1985\Scientometrics7, 369.pdf](1985/Scientometrics7,%20369.pdf)

Abstract: Citation and referencing data from recent biotechnology patients and bioscience papers is used to show that the bibliometric properties in these 2 realms are quite similar. Specifically, it is shown that the time distribution of references from both patients and papers are similar, with peak citing at 2-4 yr prior to publication or issue. This is shown to hold for patents citing patents, for papers citing papers, and for patents citing papers. There is a very skewed distribution of cited material in both patents and papers, with a relatively small number of highly cited patents and papers, and a relatively large number of documents which are cited only once or twice, or not at all. There is a substantial amount of citation from biotechnology patents to the central scientific literature. Science and technology are far more closely linked today than is normally perceived, and in fact, the division between leading edge biotechnology and modern bioscience has almost completely disappeared.

Aversa, E.S. (1985), Citation patterns of highly cited papers and their relationship to literature aging: A study of the working literature. *Scientometrics*, **7** (3-6), 383-389.

Full Text: [1985\Scientometrics7, 383.pdf](1985/Scientometrics7,%20383.pdf)

Abstract: Citation patterns of 400 very highly cited scientific papers are identified and the relationship of citation patterns to literature aging rates is investigated. Standardized citation counts for 1972 through 1980 are used as variables in a cluster analysis which groups papers with similar citation patterns and a discriminant analysis is used to refine the descriptions of clusters and to confirm the results. Among highly cited papers published in 1972, two basic citation patterns are identified: one group is highly cited in the first years following publication and declines in citedness thereafter, the second group reaches its citation peak in the sixth year following publication and declines in citedness in the seventh, eighth, and ninth years of the series. Both groups show general evidence of aging. *Price’s* suggestion that less highly cited papers age more rapidly than more highly cited papers is confernmed.

? Small, H. and Sweeney, E. (1985), Clustering the Science Citation Index using co-citations. 1. A comparison of methods. *Scientometrics*, **7** (3-6), 391-409.

Full Text: [1985\Scientometrics7, 391.pdf](1985/Scientometrics7,%20391.pdf)

Abstract: Earlier experiments in the use of co-citations to cluster *the Scienee Citation Indey (SCI)* database are reviewed. Two proposed improvements in the methodology are introduced: fractional citation counting and variable level clustering with a maximum cluster size limit. Results of an experiment using the 1979 *SCI* are described comparing the new methods with those previously employed. It is found that fractional citation counting helps reduce the bias toward high referencing fields such as biomedicine and biochemistry inherent in the use of an integer citation count threshold, and increases the range of subject matters covered by clusters. Variable level clustering, on the other hand, increases recall as measured by the percentage of highly cited items included in clusters. It is concluded that the two new methods used in combination will improve our ability to generate comprehensive maps of science as envisioned by *Derek Price.* This topic will be discussed in a forthcoming paper.

Keywords: Science Citation Index

? Christovão, H.T. (1985), The aging of the literature of biomedical sciences in developed and developing-countries. *Scientometrics*, **7** (3-6), 411-430.

Full Text: [1985\Scientometrics7, 411.pdf](1985/Scientometrics7,%20411.pdf)

Abstract: The analysis of the references contained in documents published by developed and underdeveloped countries indicate that developed and underdeveloped countries age the literature of ‘international’ areas of science in a similar pattern, underdeveloped countries age the literature reflecting ‘local’ problems slower than developed countries age the same literature, and the communication patterns among Regions follow a center-periphery model.

? Cozzens, S.E. (1985), Using the archive: Price, Derek theory of differences among the sciences. *Scientometrics*, **7** (3-6), 431-441.

Full Text: [1985\Scientometrics7, 431.pdf](1985/Scientometrics7,%20431.pdf)

Abstract: *Derek Price’s* theory of variation among the sciences stressed that the essential differences lay in the process through which scientists use each other’s results. He maintained that the critical processes were those which took place within small groups of scientists who shared an intellectual focus, and proposed that an indication of those processes could be found in referencing patterns. Later research, reviewed in this paper, has corroborated *Price* in these observations. Several bodies of evidence point to the desirability of further application of the basic concepts *Price* introduced for the purpose he proposed: as diagnostic tools to describe and compare processes of knowledge growth in the sciences.

? Cole, S. and Meyer, G.S. (1985), Little science, big science revisited. *Scientometrics*, **7** (3-6), 443-458.

Full Text: [1985\Scientometrics7, 443.pdf](1985/Scientometrics7,%20443.pdf)

Abstract: One of the basic dependent variables in the sociology of science is the rate at which scientific knowledge advances. Sociologists of science have in the past assumed that the rate of scientific advance was a function of the number of talented people entering science. This assumption was challenged by Derek Price who argued that as the number of scientists increased the number of ‘high quality’ scientists would increase at a slower rate. This paper reports the results of an empirical study of changes in the size of academic physics in the U.S. between 1963 and 1975. In each year we count the number of new Assistant Professors appointed in Ph. D.-granting departments. During the early 1960s there was a sharp increase in the size of entering cohorts followed by a sharp decline. A citation analysis indicates that the proportion of each cohort publishing work which was cited at least once in the first three years after appointment was relatively constant. This leads to the conclusion that the number of scientists capable of contributing to the advance of scientific knowledge through their published research is a linear function of the total number of people entering science.

? Yablonsky, A.I. (1985), Stable non-gaussian distributions in scientometrics. *Scientometrics*, **7** (3-6), 459-470.

Full Text: [1985\Scientometrics7, 459.pdf](1985/Scientometrics7,%20459.pdf)

Abstract: A mathematical treatment is given for the family of scientometric laws (usually referred to as the Zipf-Pareto law) that have been described byPrice and do not conform with the usual ‘Gaussian’ view of empirical distributions. An analysis of the Zipf-Pareto law in relationship with stable non Gaussian distributions. An analysis of the Zipf-Pareto law in relationship with stable non Gaussian distributions reveals, in particular, that the truncated Cauchy distribution asymptotically coincides with Lotka’s law, the most well-known frequency form of the Zipf-Pareto law. The mathematical theory of stable non Gaussian distributions, as applied to the analysis of the Zipf-Pareto law, leads to several conclusions on the mechanism of their genesis, the specific methods of processing empirical data, etc. The use of non-Gaussian processes in scientometric models suggests that this approach may result in a general mathematical theory describing the distribution of science related variables.

Keywords: Scientometrics

? Bonitz, M. (1985), Journal ranking by selective impact: New method based on SDI results and journal impact factors. *Scientometrics*, **7** (3-6), 471-485.

Full Text: [1985\Scientometrics7, 471.pdf](1985/Scientometrics7,%20471.pdf)

Abstract: Selecting an appropriate set of scientific journals which best meets the users’ needs and the dynamics of science requires usage of weight parameters by which journals can be ranked. Previous methods are based on the simple counting of relevant articles, or hits in SDI runs. The new method proposed combines hit numbers in SD! runs and journals’ impact factors to a weight parameter called Selective Impact. The experimental results obtained show that ranking by Selective Impact leads to a higher quality of the conclusions to be drawn from journal rank distributions.

? Garfield, E. (1985), In tribute to Price, Derek, John, Desolla: A citation analysis of little science, big science. *Scientometrics*, **7** (3-6), 487-503.

Full Text: [1985\Scientometrics7, 487.pdf](1985/Scientometrics7,%20487.pdf)

Abstract: *Derek John de Solla Price* died on September 3, 1983. The loss of this exciting and dynamic man is one which is felt not just by his friends, but by the scientific community as a whole. This article was originally planned as part of an essay for *Current Contents | (CC| ~* But I was delighted by the opportunity to contribute it to this special tribute issue of *Scientornetrics.*

Vlachý, J. (1985), Citation histories of scientific publications: The data sources. *Scientometrics*, **7** (3-6), 505-528.

Full Text: [1985\Scientometrics7, 505.pdf](1985/Scientometrics7,%20505.pdf)

Abstract: Some 160 data-containing studies on the citation aging of scientific literature are reviewed. The hitherto proposed time-distribution models are examined for relevant parameter values.

? Braun, T. and Zsindely, S. (1985), Growth of scientific literature and the barnaby rich effect. *Scientometrics*, **7** (3-6), 529-530.

Full Text: [1985\Scientometrics7, 529.pdf](1985/Scientometrics7,%20529.pdf)

Abstract: The Barnaby Rich effect is defined as a high output of scientific writings accompanied by complaints on the excessive productivity of other authors.

? Szabó, A.T. (1985), Alphonse de Candolle’s early scientometrics (1883, 1885) with references to recent trends in the field (1978–1983). *Scientometrics*, **8** (1-2), 13-33.

Full Text: [1985\Scientometrics8, 13.pdf](1985/Scientometrics8,%2013.pdf)

Abstract: *De Candolle* analyzed in 1883 and 1885, respectively two important fields of human cultural evolution: the domestication of crop plants and the emergence of modern science. In his *Histoire de science et des savants depuis deux sciecles*, principles were established, science indicators outlined, interactions examined and mathematical methods applied to the study of a selected data set related to scientific development. In order to compare national and international scientific communities twenty standard factors were considered and national participation in international scientific societies was analysed for 14 European countries and the United States.*De Candolle* was the first to analyse mathematically the number, dynamics and national distribution of scientists in their professional organisations, the specialization and professionalization of scientists and characterized the scientific potential of different countries with the number of international science society members per inhabitant per period (1750–1884). The role of *de Candolle* as a forerunner of modern scientometrics and the science of science is revealed in a comparison of his work with recent trends. In the first five volumes of the journal *Scientometrics* 51 papers were identified dealing with topics related to those dealt with by*de Candolle*.

? Moed, H.F., Burger, W.J.M., Frankfort, J.G. and Van Raan, A.F.J. (1985), A comparative study of bibliometric past performance analysis and peer judgment. *Scientometrics*, **8** (3-4), 149-160.

Full Text: [1985\Scientometrics8, 149.pdf](1985/Scientometrics8,%20149.pdf)

Abstract: A comparison is made between two types of research past performance analysis: the results of bibliometric indicators and the results of peer judgment. This paper focuses on two case studies: the work of Dutch National Survey Committees on Chemistry and on Biology, both compared with our bibliometric results for research groups in these disciplines at the University of Leiden. The comparison reveals a serious lack of agreement between the two types of past performance analysis. This important, science-policy relevant observation is discussed in this paper.

? Porter, A.L. and Chubin, D.E. (1985), An indicator of cross-disciplinary research. *Scientometrics*, **8** (3-4), 161-176.

Full Text: [1985\Scientometrics8, 161.pdf](1985/Scientometrics8,%20161.pdf)

Abstract: Study of interdisciplinary research processes and performance is hampered by a lack of data. This project investigated possible indicators based in the open scientific literature to measure such processes. Focusing on the Journal Citation Reports as a suitable data base, alternative indicators were validated on a sample of 383 articles drawn from 19 journals. The results support the use of Citations Outside Category as an indicator of cross-disciplinary research activity. An estimated version of this indicator is used to examine three research categories - Demography, Operations Research/Management Science, and Toxicology - as to the extent of cross-disciplinary citation occurring by the journals in these categories and to them. Results suggest that Citations Outside Category can be a quite informative bibliometric measure. A key substantive finding is that citation across broad field categories (engineering, life sciences, physical sciences, and social sciences) is extremely infrequent.

? Moed, H.F., Burger, W.J.M., Frankfort, J.G. and Vanraan, A.F.J. (1985), The application of bibliometric indicators: Important field-dependent and time-dependent factors to be considered. *Scientometrics*, **8** (3-4), 177-204.

Full Text: [1985\Scientometrics8, 177.pdf](1985/Scientometrics8,%20177.pdf)

Abstract: An analysis of three major problems in the application of bibliometric research performance indicators is made in three separate sections. In the first section, the influence of field-dependent citation practices is analysed. The results indicate that rankings of publications from different fields, based on citation counts, can be affected seriously by differences between citation characteristics in those fields. If certain assumptions hold, one should expect high (short term) citation levels in Biochemistry, Celbiology and Biophysics. Medium citation levels are to be expected in Experimental and Molecular Physics, Physical and Organic Chemistry, Pharmacology and Plant Physiology, and low citation levels in Mathematics, Taxonomy, Pharmacognosy and Inorganic Solid State Chemistry. In the second section time-dependent factors are studied. It is shown that trend-analyses of output and impact based on bibliometric scores can be disturbed by changes in the SCI-database and in publication and citation practices. One of the disturbing factors is shown to be the inclusion of so called Books into the SCI data-base in 1977. Finally, in the third section a case is presented which illustrates the consequences of operating on incomplete bibliometric data in the evaluation of scientific performance. A completeness percentage of 99% for publication data is proposed as a standard in evaluations of the performance of small university research groups.

? Lange, L. (1985), Effects of disciplines and countries on citation habits: An analysis of empirical papers in behavioral-sciences. *Scientometrics*, **8** (3-4), 205-215.

Full Text: [1985\Scientometrics8, 205.pdf](1985/Scientometrics8,%20205.pdf)

Abstract: The theoretical introductions in empirical journal articles have been analyzed looking for factors determining citation habits. Own-country-biases and English-American predominance in citations were not regularly found. Preferred language of the cited publications and absolute citation frequencies were dependent upon both the disciplines and the countries where the journals are published. However, relative citation frequencies (citations related to the length of the text available) have been found to be rather constant across countries (within psychology and psychiatry, respectively) which indicates no such dependence.

? Libkind, A.N. (1985), One approach to study communication in science. *Scientometrics*, **8** (3-4), 217-231.

Full Text: [1985\Scientometrics8, 217.pdf](1985/Scientometrics8,%20217.pdf)

Abstract: The hypothesis proposed by the author expresses that Zipf’s law is only fulfilled on rank distributions which correspond to highly integrated (closed) subject fields. This hypothesis was tested on vast amount of empirical data. It was shown that document files in integrated fields are characterised by thematic, chronological (and sometimes geographical) closedness, as well as closedness by citation. Relationships were found between empirical facts usually considered in isolation within the frameworks of different scientometric and bibliometric theories (the theory of information concentration and scattering, obsolescence theory, theory of changing source productivity).

? Pravdic, N. and Pekorari, R. (1985), The citing practices of the authors to the national journals in mathematics, physics, and chemistry. *Scientometrics*, **8** (3-4), 233-246.

Full Text: [1985\Scientometrics8, 233.pdf](1985/Scientometrics8,%20233.pdf)

Abstract: In this essentially empirical study a comparative analysis of the age of references in scientific papers in three subject fields is performed. Comparisons ate made: 1. Among national and leading journals in the same scientific field, 2.for a number of high quality journals in physics and chemistry, and 3. between several groups of authors (according to the countries of origin), contributing to the same journals in chemistry, variations found in the journals ‘citing half-life’ values suggest that, if properly interpreted, the citing half-life might reflect the journal’s quality and might serve as a certain indicator for the citing practices of specific groups of authors.

Note: TTopic

? Rothman, H. and Lester, G. (1985), The use of bibliometric indicators in the study of insecticide research. *Scientometrics*, **8** (3-4), 247-262.

Full Text: [1985\Scientometrics8, 247.pdf](1985/Scientometrics8,%20247.pdf)

Abstract: This paper reports part of a historical study of insecticide development. We analysed accumulated references to specific insecticide groups in text books, and index references to a large number of specific insecticides in the Review of Applied Entomology (Ser. A) over the period 1916-1970. The paper describes our techniques for analysing the resulting research publication growth curves for these compounds. Our data did not fit the ‘classical’ S-curves, and possible explanations for this are discussed. Bibliometric time series data may exhibit various inconsistencies, and we describe an approach to handling such ‘dirty data’. We concluded that, our quantitative approach produces a picture of the development of insecticides that fits the accepted view derived by qualitative historiography, is very sensitive to trends in pesticide research, and might be a useful adjunct to technology forecasting as well as to historical studies.

Keywords: Science

Arunachalam, S. and Hirannaiah, S. (1985), Has journal of astrophysics and astronomy a future. *Scientometrics*, **8** (1-2), 3-11.

Full Text: [1985\Scientometrics8, 3.pdf](1985/Scientometrics8,%203.pdf)

Abstract: A numbqr of new science journals are born every year. Many of them survive for a long time but do not make a significant impact on the subjects which they try to serve. There are others which make an impression right from their first issues. In the last decade several new journals have been started in India, many of them by the Indian Academy of Sciences. The first of these new journals, Pramgna, which was established in 1973, turned out to be a good national medium for Indian physicists but has so far failed to achieve the high international standing aimed at by its founders. The NationaI Academy of Sciences Letters. started by another academy of sciences, proved to be a non-starter as far as international standing is concerned. In 1980 astronomers and astrophysicists in India sought and obtained a medium for themselves, thanks to the cooperation of the Indian Academy of Sciences which agreed to publish an inexpensive quarterly journal. The first issue of Journal of Astrophysics and Astronomy appeared in September 1980.

? Szabo, A.T. (1985), Decandolle, alphonse early scientometrics (1883, 1885) with references to recent trends in the field (1978-1983). *Scientometrics*, **8** (1-2), 13-33.

Full Text: [1985\Scientometrics8, 13.pdf](1985/Scientometrics8,%2013.pdf)

Abstract: *De Candolle* analyzed in 1883 and 1885, respectively two important fields of human cultural evolution: the domestication of crop plants and the emergence of modern science. In his *Histoire de science et des savants depuis deux sciecles,* principles were established, science indicators outlined, interactions examined and mathematical methods applied to the study of a selected data set related to scientific development. In order to compare national and international scientific communities twenty standard factors were considered and national participation in international scientific societies was analysed for 14 European countries and the United States. *De Candolle* was the first to analyse mathematically the number, dynamics and national distribution of scientists in their professional organisations, the specialization and professionalization of scientists and characterized the scientific potential of different countries with the number of international science society members per inhabitant per period (1750-1884). The role *of de Candolle* as a forerunner of modern scientometrics and the science of science is revealed in a comparison of his work with recent trends. In the first five volumes of the journal *Scientometrics* 51 papers were identified dealing with topics related to those dealt with by *de Candolle.*

Keywords: Scientometrics

? Shrum, W. (1985), Quality judgments of technical fields: Bias, marginality, and the role of the elite. *Scientometrics*, **8** (1-2), 35-57.

Full Text: [1985\Scientometrics8, 35.pdf](1985/Scientometrics8,%2035.pdf)

Abstract: Most accounts of scientific and technological development stress the importance of quality judgments for particular technical fields. This study investigates social psychological and: structural factors associated with such judgments for nineteen fields in nuclear waste and solar cell research. The results of the analysis indicate a tendency toward positive bias for fields in which researchers have been active, for this bias to be stronger in less innovative fields, and for elite membership to affect this bias in different ways depending on the nature of the system. In addition, there was no tendency for those with a high level of social contacts to others working in a field to display a positive bias, except in consensually innovative fields.

? Zhao, H.Z. and Jiang, G.H. (1985), Shifting of worlds’ scientific center and scientists’ social ages. *Scientometrics*, **8** (1-2), 59-80

Full Text: [1985\Scientometrics8, 59.pdf](1985/Scientometrics8,%2059.pdf)

Abstract: This paper proposes to take the age at which a scientist achieved his first success as his famous-becoming age, uses a statistical method to obtaine the optimum age of scientists for making scientific discoveries, uses the same to find the experiential formula that explains the relationship between the number of scientific achievement and the number of scientists and their ages. Employing this formula, it expounds to some extent the Yuasa Phenomenon. For conclusion it analyzes the scientific value of experiential formula and the reliability of its scope of prediction.

? Balog, C. (1985), Agricultural-research in New-Zealand. *Scientometrics*, **8** (1-2), 81-89.

Full Text: [1985\Scientometrics8, 81.pdf](1985/Scientometrics8,%2081.pdf)

Abstract: A study of the subject areas of pacts published in *New Zealand Journal of Agricultural Research* shows that there has been little variation in the major areas of agrieultttral research over 21 years. In a specific area of research, the use and effects of fertflisers, there is little change in the number of papers published on this subject until 1972 when there is a slight decrease in the number of published articles.

? Swales, J.M. (1985), English-language papers and authors 1st language: Preliminary explorations. *Scientometrics*, **8** (1-2), 91-101.

Full Text: [1985\Scientometrics8, 91.pdf](1985/Scientometrics8,%2091.pdf)

Abstract: The paper argues for greater linguistic sensitivity in seientometric research, discusses *Baldauf and Jernudd,* 11~13and raises issues of North/South, English/non-English imbalance in research communication. It then proposes a procedure for identifying native/non-native speaker status of authors in English periodical literature on textual evidence. Preliminary application to 623 articles is reported and evaluated. The Health Science NNS percentage was 23%, in Economics half tliat. In both there were few papers of Third World provenance, thus supporting *Baldaufand Jernudd.* It is suggested that Scientometries could contribute to the teaching of Research English, against a background of adjusting suspected imbalance.

? Davies, B.R. and Lazniarz, J.M. (1985), A site selection model for high technology manufacturing firms in the United-States. *Scientometrics*, **8** (1-2), 103-116.

Full Text: [1985\Scientometrics8, 103.pdf](1985/Scientometrics8,%20103.pdf)

Abstract: This article offers a quantitative model for site selection by high technology manufacturing firms. In the past, site selection studies have usually been qualitative in nature, and very subjective. This is an attempt to introduce a more objective quantitative approach. The site selection factors most important to high technology manufacturing firms were identified, ranked and weighted based on a US Joint Economic Committee survey of such firms. The eight most important factors were: the availability of technical and professional workers, labor costs, tax climate, academic institutions, cost of living, transportation for people, and access to markets. Demographic data on these factors were collected and analyzed for 32 developing high technology areas in the United States. By using the quantitative model, a score was developed for each area, allowing them to be ranked as R & D manufacturing environments. This model should prove a useful tool for both regional planners and high-tech companies seeking to relocate.

Keywords: United States

Amir, S. (1985), On the degree of interdisciplinarity of research programs: A quantitative assessment. *Scientometrics*, **8** (1-2), 117-136.

Full Text: [1985\Scientometrics8, 117.pdf](1985/Scientometrics8,%20117.pdf)

Abstract: It is widely maintained that the study of policy alternatives, particularly if they are associated with introducing new tehcnologies that may engender vast social and environmental repercussions, ought to be interdisciplinary. There is, however, much confusion in the literature as to what exactly is meant by the term interdisciplinary. In the present paper, we quantitatively assess the extent of interdisciplinarity of studies and of research programs. First, we propose several working definitions of the concept of interdisciplinarity. Second, we consider the construction of indicators that quantify these definitions. Third, as an example, we examine whether or not a given policy oriented research program is truly interdisciplinary.

? Schubert, A. (1985), Quantitative studies of science: A current bibliography. *Scientometrics*, **8** (1-2), 137-140.

Full Text: [1985\Scientometrics8, 137.pdf](1985/Scientometrics8,%20137.pdf)

? Moravcsik, M.J. (1985), How the laws of physics lie: Cartwright, N. *Scientometrics*, **8** (1-2), 141-142.

Full Text: [1985\Scientometrics8, 141.pdf](1985/Scientometrics8,%20141.pdf)

Abstract:

? Moravcsik, M.J. (1985), Science and scientific researchers in modern society: Dickinson, JP. *Scientometrics*, **8** (1-2), 143.

Full Text: [1985\Scientometrics8, 143.pdf](1985/Scientometrics8,%20143.pdf)

Aloni, M. (1985), Patterns of information transfer among engineers and applied scientists in complex organizations: A partial review. *Scientometrics*, **8** (5-6), 279-300.

Full Text: [1985\Scientometrics8, 279.pdf](1985/Scientometrics8,%20279.pdf)

Abstract: This review discusses studies of informal communication of scientific and technical information published in the American management literature between 1976 and 1982. While investigated formerly by information scientists, the subject has been mentioned only infrequently in the literature and abstracts of information science in recent years. Management scientists view the informal information transfer as a special type of organizational communication. Among the papers reviewed, special attention is accorded to the publications by *Tushman* who has extended and developed *Allen’s* approach. The implications of the insights gained for the information worker and information scientist are discussed in the conclusions.

Note: CCountry

Arunachalam, S. and Garg, K.C. (1985), A small country in a world of big science: A preliminary bibliometric study of science in Singapore. *Scientometrics*, **8** (5-6), 301-313.

Full Text: [1985\Scientometrics8, 301.pdf](1985/Scientometrics8,%20301.pdf)

Abstract: An analysis of 258 papers published from Singapore and covered in Science Citation Index (SCI) 1979 and 1980 indicates that (1) much of R&D in Singapore pertains to medical research, (2) almost all the papers are published in English language periodicals published from the western world, (3) nearly two-thirds of Singapore’s publication output is accounted for by the University of Singapore, and (4) by the large papers from Singapore are rarely cited, even if many of them have appeared in journals having impact factor greater than one.

? Diamond, A.M. (1985), The money value of citations to single-authored and multiple-authored articles. *Scientometrics*, **8** (5-6), 315-320.

Full Text: [1985\Scientometrics8, 315.pdf](1985/Scientometrics8,%20315.pdf)

Abstract: This note presents evidence for the surprising conclusion that a citation to a multiple-authored article is worth more to its author than a citation to a single-authored article.

? Small, H., Sweeney, E. and Greenlee, E. (1985), Clustering the Science Citation Index using co-citations. 2. Mapping science. *Scientometrics*, **8** (5-6), 321-340.

Full Text: [1985\Scientometrics8, 321.pdf](1985/Scientometrics8,%20321.pdf)

Abstract: Previous attempts to map science using the co-citation clustering methodology are reviewed, and their shortcomings analyzed. Two enhancements of the methodology presented in Part I of the paper-fractional citation counting and variable level clusteringare briefly described and a third enhancement, the iterative clustering of clusters, is introduced. When combined, these three techniques improve our ability to generate comprehensive and representative mappings of science across the multidisciplinary *Science Citation Index (SCI)* data base. Results of a four step analysis of the 1979 *SCI* are presented, and the resulting map at the fourth iteration is described in detail. The map shows a tightly integrated network of approximate disciplinary regions, unique in that for the first time links between mathematics and biomedical science have brought about a closure of the previously linear arrangement of disciplines. Disciplinary balance between biomedical and physical science has improved, and the appearance of less cited subject areas, such as mathematics and applied science, makes this map the most comprehensive one yet produced by the co-citation methodology. Remaining problems and goals for future work are discussed.

Keywords: Science Citation Index

? Doreian, P. (1985), A measure of standing of journals in stratified networks. *Scientometrics*, **8** (5-6), 341-363.

Full Text: [1985\Scientometrics8, 341.pdf](1985/Scientometrics8,%20341.pdf)

Abstract: The concept of a stratified journal network is advanced where the nodes are journals and the relation is citation aggregated over the articles in these journals. The standing of the journals in the network can be measured through tools based on input-output models. These measures can be used to chart the changing status of journals at different time points.

Note: CCountry

? Sengupta, I.N. (1985), The growth of biophysical literature. *Scientometrics*, **8** (5-6), 365-376.

Full Text: [1985\Scientometrics8, 365.pdf](1985/Scientometrics8,%20365.pdf)

Abstract: The enormous growth of biophysical literature has created great difficulties in tracking out the significant literature of the subject. To cope with this unprecedented growth of literature, a new bibliometric technique has been applied to rank periodicals in the field based on 4228 citation data collected from the bibliographic data base published in the source journal namely, Annual Review of Biophysics. This list is expected to reflect the impact of literature on the advancement of knowledge in the field of biophysics. A striking feature of the ranking list is the high positions occupied by multidisciplinary science journals and biochemical journals as compared to journals exclusively and specifically devoted to biophysics or any particular aspects of it. Other remarkable findings are the wide scatter of biophysics literature, dominance of the USA journals and status attained by English as the preferred medium of communications of the working biophysicists. The data are also analysed according to subject categorization of the ranked periodicals. The results of the present study have been discussed in relation to Bradford’s Law of Scattering and validity of the extension of the law, suggested earlier, has been well established. It is expected that the present ranking list will enable the working biophysicists to select journals from the viewpoint of their significance to the active areas of present-day biophysical research.

? Snizek, W.E. (1986), A reexamination of the ortega hypothesis: The Dutch case. *Scientometrics*, **9** (1-2), 3-11.

Full Text: [1986\Scientometrics9, 3.pdf](1986/Scientometrics9,%203.pdf)

Abstract: Using data collected for a sample of 69 Dutch physicists, the present study employs a. multivariate approach in order to re-examine the Ortega hypothesis. Stated succinctly, the Ortega hypothesis maintains that, in large measure, science has progressed through the efforts of many quite average scientists. Based on a combined citation search of 2763 source and reference authors, eminent scientists are shown to cite other eminent scientists, although not to the extent reported among American physicists in earlier research by the *Coles.* Thetendency for eminent scientists to cite other eminent scientists is a rather recent occurrence in The Netherlands, and may signal a major trend in the differential allocation of facilities and resources .which, in turn, impact on the development of science in that country. In addition to the citation rate of source author’s year of article’s publication and length of source author’s professional experience, are also shown to be significantly related to the eminence of reference authors cited, thereby signaling caution concerning rejection of the Ortega hypothesis.

? Lawani, S.M. (1986), Some bibliometric correlates of quality in scientific research. *Scientometrics*, **9** (1-2), 13-26.

Full Text: [1986\Scientometrics9, 13.pdf](1986/Scientometrics9,%2013.pdf)

Abstract: The following kinds of data were collected on three samples of cancer research literature representing three levels of quality: (1) collaboration as measured by the number of authors per paper, (2) quantitative productivity of countries, (3) diachronous citations covering the first five years of publicaiton, (4) total self-citations, (5) proportions of self-citations made by first-named authors, and (6) the extent of dispersion of articles among journals. Analyses showed that as the number of authors per paper increases, the proportion of high quality papers also increases and the Collaborative Index can be used to measure quality in the aggregate. It was found that the quantity and quality of cancer research done in a country are positively related. All analyses of the citation data confirmed the hypotheses that highly rated papers are significantly more highly cited than average papers and the rates of uncitedness decline with quality. The proportion of self-citations to total citations decreases with increasing quality and, on average, first-named authors of quality papers cite them proportionally fewer times than first-named authors of run-of-the-mill papers do. This study also shows that, as quality increases, the extent of literature scatter or dispersion increases.

? Zhao, H.Z. and Jiang, G.H. (1986), Life-Span and precocity of scientists. *Scientometrics*, **9** (1-2), 27-36.

Full Text: [1986\Scientometrics9, 27.pdf](1986/Scientometrics9,%2027.pdf)

Abstract: Studies on the life-span of past scientists according to data of the *Chronicle of Major Events of Natural Sciences* have found that the age of optimum peak value of scientific discovery is about half the peak value of their life-span. Achievements of those scientists who made a name before 25 years old are 44 percent more than average and their life efficiency is 1.7 times that of the average. Therefore it is an effective measure to train precocious scientists for a nation in her strive to catch up with or surpass world level in science.

? Frijdal, A. and Degreve, J.P. (1986), Communication activities in scientific disciplines in Belgium. *Scientometrics*, **9** (1-2), 37-49.

Full Text: [1986\Scientometrics9, 37.pdf](1986/Scientometrics9,%2037.pdf)

Abstract: The communication behaviour of Belgian university scientists is investigated over the period of 1977-1979. For 5 broad scientific domains the general characteristics are given and the distribution of the scientists over groups with 1 to 20 communications per three year is discussed. For two domains, Arts and Basic Sciences, an analysis is given of constituent disciplines. The present investigation presents a background profile of the communication activities, enabling evaluation of extreme activity in the disciplines discussed.

Keywords: Belgium

? Balog, C. (1986), Information-flow to genetics journals. *Scientometrics*, **9** (1-2), 51-57.

Full Text: [1986\Scientometrics9, 51.pdf](1986/Scientometrics9,%2051.pdf)

Abstract: The origin of information for 5 genetics journals was traced for the years 1975, 1978 and 1982. Maps of the interrelationships between cited journals indicate that the information for genetics journals originates with the biochemical journals and passes down to the genetics journals via the multidisciptinary science journals. The 5 genetics journals can be divided into 2 levels: Level 1 - those journals that never cite each other but cite level 2 journals, Level 2 - those journals that serve as a source of information for level 1 journals. The use of level 2 journals by level 1 journals declines from 1975 to 1982 because of a decline in citations by two of the level 1 journals.

? Pontigo, J. and Lancaster, F.W. (1986), Qualitative aspects of the Bradford distribution. *Scientometrics*, **9** (1-2), 59-70.

Full Text: [1986\Scientometrics9, 59.pdf](1986/Scientometrics9,%2059.pdf)

Abstract: A study was performed to determine whether the quality of journal articles declines as one moves through successively less productive Bradford zones. Two measures of quality - rate of citation and expert judgement - were used. It was found that articles in the least productive zone were cited significantly less than those in the most productive zone. However, experts did not judge them to be of lesser quality.

? Velho, L. (1986), The meaning of citation in the context of a scientifically peripheral country. *Scientometrics*, **9** (1-2), 71-89.

Full Text: [1986\Scientometrics9, 71.pdf](1986/Scientometrics9,%2071.pdf)

Abstract: This paper reports an investigation into the referencing pattern of Brazilian agricultural scientists. The study was based on the use of both quantitative data - citations appearing in a sizeable sample of articles pubhshed by these scientists - and qualitative data – interviews with a large number of scientists who authored the source papers. The aim was to explore the extent to which citation counts may be taken as valid indicators of the quality, influence or impact of pubhshed scientific knowledge in the general context of a scientifically peripheral country. The findings presented confirm the view that in this context, citation patterns are significantly influenced by factors ‘external’ to the scientific realm and, thus, reflect neither simply the quality, influence nor even the impact of the research work referred to.

? Nalimov, V.V. (1986), Theories of research, Vol -I-II - Nowakowska, M. *Scientometrics*, **9** (1-2), 91-93.

Full Text: [1986\Scientometrics9, 91.pdf](1986/Scientometrics9,%2091.pdf)

? Moravcsik, M.J. (1986), Science and technology for international development: An assessment of United-States policies and programs - Morgan, RP. *Scientometrics*, **9** (1-2), 93-95.

Full Text: [1986\Scientometrics9, 93.pdf](1986/Scientometrics9,%2093.pdf)

Keywords: United States

? Moravcsik, M.J. (1986), Foresight in science: Picking the winners - Irvine, J, Martin, B. *Scientometrics*, **9** (1-2), 95-97.

Full Text: [1986\Scientometrics9, 95.pdf](1986/Scientometrics9,%2095.pdf)

? Leydesdorff, L. (1986), The development of frames of references. *Scientometrics*, **9** (3-4), 103-125.

Full Text: [1986\Scientometrics9, 103.pdf](1986/Scientometrics9,%20103.pdf)

Abstract: Measurement of the effectiveness of science policies is analyzed as a multi-level problem. Journal-journal citations are discussed as a potential candidate for a domain beyond the control of policy-makers and authors or research groups and therefore may function as a relatively stable and easily accessible baseline for the ‘calibration’ of outputs and outcomes of science policy. A method is developed, using *SCI’s JCRs* which is then applied to the two cases of water pollution and humanisation of labor. This method can also be used as a simple indicator for the development of journal-journal citation patterns over time.

? Simonton, D.K. (1986), Multiples, poisson-distributions, and chance: An analysis of the Brannigan-Wanner model. *Scientometrics*, **9** (3-4), 127-137.

Full Text: [1986\Scientometrics9, 127.pdf](1986/Scientometrics9,%20127.pdf)

Abstract: *Brannigan* and *Wanner* argue that the empirical distribution of multiple grades can be more adequately explained in terms of a negative contagious poisson model. This alternative is based on a Zeitgeist theory which places emphasis on the role of communication in scientific discovery. Nonetheless, a detailed analysis indicates the following: (a) mathematically, the simple Poisson is the limiting case of the contagious Poisson when the contagion parameter approaches zero, (b) empirically, the mean and variance are so nearly equal (i. e., the contagion effect is very small) that predictions from the contagious Poisson are virtually equivalent to those of the simple Poisson, (c) in particular, both distributions predict that multiples are less common than singletons and even nulltons, the latter occurring with a probability of over one third (thereby implying that chance plays a much bigger part than Zeitgeist or maturational theories would suggest), (d) estimates from the *Simonton, Merton,* and *Ogburn-Thomas* data sets all concur that the contagion effect is not only small, but positive besides, yielding a modest positive contagious Poisson that contradicts the principal tenet of the communication interpretation.

? Yuthavong, Y. (1986), Bibliometric indicators of scientific activity in Thailand. *Scientometrics*, **9** (3-4), 139-143.

Full Text: [1986\Scientometrics9, 139.pdf](1986/Scientometrics9,%20139.pdf)

Abstract: The scientific output of major institutions in Thailand was examined from the number of international publications covered by Science Citation Index (SCI), publications in Journal of the Science Society of Thailand (J. Sci. Soc. Thailand) and abstracts presented at the annual symposium of the Science Society of Thailand. A good correlation (r = 0.92) was observed between the number of publications covered by SCI and in Journal of the Science Society of Thailand, while a poorer correlation (r = 0.73) was observed between the former and the number of symposium abstracts.

Keywords: Thailand

? Hargens, L.L. (1986), Migration patterns of united-states PhDs among disciplines and specialties. *Scientometrics*, **9** (3-4), 145-164.

Full Text: [1986\Scientometrics9, 145.pdf](1986/Scientometrics9,%20145.pdf)

Abstract: Patterns of migration among disciplines and specialties are examined using data from a large survey of U. S. Ph.D. s in a broad range of fields. Mappings of scholarly fields are derived from the migration patterns and these mappings are largely consistent with results from previous studies using citation flows and other measures of field similarities. Migration patterns suggest that there are two boundaries dividing the fields in this analysis, and that hierarchical relations among disciplines are weak or absent. In contrast, specialties within a discipline are more lqkely to exhibit structural hierarchies.

Keywords: United States

? Nesvetailov, G.A. and Gurevich, I.G. (1986), Analysis and planning of a series of multisectional scientific-conferences (heat and mass transfer case). *Scientometrics*, **9** (3-4), 165-176.

Full Text: [1986\Scientometrics9, 165.pdf](1986/Scientometrics9,%20165.pdf)

Abstract: A scientometric method is developed for studying the intersectional communications at scientific conferences. As an example, a series of multisectional Heat and Mass Transfer Conferences held in Minsk, USSR, during the years 1961-1980 are considered. The clusters of the interplay between the sections are constructed on the basis of the data from the registration cards of the Conference participants. The matrix of the topical interrelation of sections enables one to calculate the coefficient of the information impact of a section. A comparison of this coefficient with the resource indicators of sections makes it possible to upgrade the scientific justification of planning a series of multisectional scientific conferences.

? Todorov, R. and Atanassov, K. (1986), Formal communication in science: A model based on generalized nets. *Scientometrics*, **9** (3-4), 177-185.

Full Text: [1986\Scientometrics9, 177.pdf](1986/Scientometrics9,%20177.pdf)

Abstract: A schematic overview of the formal communication process is first presented. Emphasis is placed only on the specific functions and participants required to transfer article manuscripts from the author to the reader of scientific journals. For the description of this process a mathematical model based on generalized nets (GN) is then proposed. Some advantages of the GN as compared to other models are shown. Model application is not included since the programme package which realizes the GN is in a stage of preparation.

? Herrmann, D.B. (1986), Astronomy in the twentieth century. *Scientometrics*, **9** (3-4), 187-191.

Full Text: [1986\Scientometrics9, 187.pdf](1986/Scientometrics9,%20187.pdf)

Abstract: This paper is based on the *Source Book in Astronomy and Astrophysics 1900-1975* which is considered representative of the pioneer research work in the field. The distribution of important scientific achievements over a certain period, their distribution by subject area and sources, single or multiple authorship and age of techniques relevant to these areas are quantitatively examined. In some cases result: are obtained as known from the analysis of the overall output of the sciences (including astronomy). As regards, however, the frequency of published important papers and the role of the latest technique pioneer achievements differ significantly from the total of scientific publications.

? Lipatov, Yu.S. and Denisenko, L.V. (1986), On the behavior of information flows in multicomponent polymer systems research. *Scientometrics*, **9** (5-6), 197-207.

Full Text: [1986\Scientometrics9, 197.pdf](1986/Scientometrics9,%20197.pdf)

Abstract: The behaviour of information flows in multieomponent polymer systems over the 1979-1983 period is analyzed. It has been found that this field of science obeys general relationships valid for other established sciences. Its special features axe a high concentration of information (only 9 journals) and a wide scatter of papers among a great number of peripheral journals. The doubling times for papers and journals as well as the doubling period for papers in a single journal have been determined, they axe 3.2, 4.6 and 5.6 years respectively.

? Jimenez, J., Navarro, M.A. and Rees, M.W. (1986), Scientific-research areas in Mexico: Growth patterns in the late seventies. *Scientometrics*, **9** (5-6), 209-221.

Full Text: [1986\Scientometrics9, 209.pdf](1986/Scientometrics9,%20209.pdf)

Abstract: A longitudinal study of ten Mexican research areas was carried out in the late 1970s. In the study, research institutions were classified by a group of experts as primary and secondary, depending on the quality and quantity of research output. New institutions created during this time period were also classified as primary or secondary. Examination of the data shows a greater growth in the number of research personnel in primary institutions, evidence of uneven distribution of resources. Furthermore, due to the high turnover of qualified personnel observed in secondary institutions, they are at a disadvantage in forming mature, stable research groups, and are often precluded from becoming first rate researeh centers. Sihce the national science and technology system does not facilitate the movement of institutions from secondary to primary positions, it is recommended that whenever a new institution is created, it should be provided with appropriate resources, both human and material, to make sure it will be considered as first rank from its inception. Also, in order to reduce the gap between primary and secondary institutions, long range strategies, including the provision of high quality researchers, should be developed to facilitate the upgrading of the secondary institutions.

Keywords: Mexico

? Simeon, VL., Momčilović, B., Kralj, Z. and Grgas, B. (1986), Multivariate statistical analysis of the bibliographic output from a research institution, in relation to the measures of scientific policy. *Scientometrics*, **9** (5-6), 223-230.

Full Text: [1986\Scientometrics9, 223.pdf](1986/Scientometrics9,%20223.pdf)

Abstract: The publications produced in a medical research institute in a 16 year interval were classified into five categories (scientific papers in the journals covered by *Current Contents* or *Science Citation Index,* scientific papers in other journals, books and monographs, technical papers, congress and symposia communications) and counted for each year separately. The number of researchers and yearly budgets were also recorded. The data were analysed by contingency table, correlation and factor-analytical methods. It was shown that, upon introducing quantitative minimal criteria for job promotions, the proportion of scientific papers increased. Principal component analysis indicated that the data can be approximately represented as linear combinations of three mutually independent factors. The approach used is recommended for evaluating the production of scientific information in research institutions and for assessing the effects of the measures of scientific policy.

? Schubert, A. and Telcs, A. (1986), Publication potential: An indicator of scientific strength for cross-national comparisons. *Scientometrics*, **9** (5-6), 231-238.

Full Text: [1986\Scientometrics9, 231.pdf](1986/Scientometrics9,%20231.pdf)

Abstract: A new indicator, called the *publication potential,* is proposed to measure scientific strength of different countries. The indicator is based on *SC1* author counts and publication frequency distributions, Not depending on national statistical reports, it avoids the ambiguities of statistical definitions and methods, thereby providing a solid ground for cross-national comparisons. Publication based and statistical survey data for 34 countries axe compared and some of the most conspicuous discrepancies are pinpointed.

? Crouch, D., Irvine, J. and Martin, B.R. (1986), Bibliometric analysis for science policy: An evaluation of the United Kingdom’s research performance in ocean currents and protein crystallography. *Scientometrics*, **9** (5-6), 239-267.

Full Text: [1986\Scientometrics9, 239.pdf](1986/Scientometrics9,%20239.pdf)

Abstract: This paper presents the results of a study of Britain’s scientific performance in the fields of ocean currents and protein crystallography carried out for the Advisory Board for the Research Councils (ABRC). Using a range of publication and citation indicators, the study aimed to explore the potential value to science policy-making of low-cost scientometric approaches to research evaluation.

Keywords: Science, United Kingdom

? Simonton, D.K. (1986), Multiple discovery: Some monte carlo simulations and gedanken experiments. *Scientometrics*, **9** (5-6), 269-280.

Full Text: [1986\Scientometrics9, 269.pdf](1986/Scientometrics9,%20269.pdf)

Abstract: Two major interpretations of multiples have been offered, the traditional one based on the scientific zeitgeist, the more recent one based on chance processes. To clarify the issues involved in any plausible explanation, six successive Monte Carlo simulations were developed. Though all models started with the same underlying probabilistic mechanism, several elaborations were introduced, including,exhaustion, communication of both successes and failures, and variation in success probability. The models yield the same probability distribution for multiple grades, but they disagree on the frequency of nulltons. Additional Gedanken experiments dealt with the zeitgeist notions of a causal link between potential contributions.

Keywords: Monte Carlo

? Schubert, A. and Braun, T. (1986), Relative indicators and relational charts for comparative-assessment of publication output and citation impact. *Scientometrics*, **9** (5-6), 281-291.

Full Text: [1986\Scientometrics9, 281.pdf](1986/Scientometrics9,%20281.pdf)

Abstract: Cross-field comparison of *scientometric indicators* 1 is severely hindered by the differences in publication and citation habits of science fields. However, relating publication and citation indicators to proper field-specific reference standards, *relative indicators* can be built, which may prove rather useful in the comparative assessment of scientists, groups, institutions or countries. The use of *relational charts* in displaying the indicators broadens the scope of such assessments. Relative indicators of chemistry research in 25 countries are presented as an illustrative example.

? Schubert, A. (1986), Quantitative studies of science: A current bibliography. 9. *Scientometrics*, **9** (5-6), 293-304.

Full Text: [1986\Scientometrics9, 293.pdf](1986/Scientometrics9,%20293.pdf)

? Morgan, R.P. (1986), Technology, finance and development: An analysis of the world-bank as a technological institution - Weiss, C, Jequier, N. *Scientometrics*, **9** (5-6), 305-306.

Full Text: [1986\Scientometrics9, 305.pdf](1986/Scientometrics9,%20305.pdf)

? Haitun, S.D. (1986), Problems of quantitative-analysis of scientific activities: The nonadditivity of data. Part 1. Statement and Solution. *Scientometrics*, **10** (1-2), 3-16.

Full Text: [1986\Scientometrics10, 3.pdf](1986/Scientometrics10,%203.pdf)

Abstract: A viewpoint is given, according to which, additivity may be defined only at the intuition level and quantitative latent variables are ‘origin additive’. The proposed solution to the non-additivity problem consists in restricting quantitative indicator scales by the so-called ‘natural’, in particular, open scales.

? Moed, H.F. and Vanraan, A.F.J. (1986), Observations and hypotheses on the phenomenon of multiple citation to a research groups oeuvre. *Scientometrics*, **10** (1-2), 17-33.

Full Text: [1986\Scientometrics10, 17.pdf](1986/Scientometrics10,%2017.pdf)

Abstract: This paper analyses the phenomenon when a publication referring to the oeuvre of a research group (i.e. all the articles published by its members) cites several articles rather than one article from that oeuvre (multiple citations, MC). It is shown that significant differences exist between research groups with respect to the frequency at which MC to their respective oeuvres occur, and that these differences affect to some extent rankings of these groups based on citation counts. In order to find an explanation for our results, four factors are discussed: (1) the impact of a research group, (2) mutual multiple citing arrangements, (3) the size of a group’s oeuvre and (4): the degree of common intellectual interest between the research activities in a group. No definite conclusions can be drawn yet on the extent to which these factors are responsible for the observed patterns in the MC frequency. We conclude however that attempts to identify ‘top’ or ‘sub-top’ groups in comparative evaluations based on citation analysis should be performed with the greatest care.

? Levine, L.O. (1986), Prolific inventors: A bibliometric analysis. *Scientometrics*, **10** (1-2), 35-42.

Full Text: [1986\Scientometrics10, 35.pdf](1986/Scientometrics10,%2035.pdf)

Abstract: Patent information on 7392 inventors who received 9 or more U.S. Patents during 1975-84 was obtained. Analysis of the frequency distribution of patents per inventor reveals an approximately logarithmic decline from 9 to approximately 45 patents per inventor. The rate of decline decreases significantly for patent output above 45 patents per inventor. Patent citation analysis on 45 randomly selected inventors was performed. This sample included inventors who received from 9 to over 100 patents. The group received 1.79 citations per patent, 56.8% of the patents received at least 1 citation, and 2.7% of the patents received 10 or more citations. No statistically significant differences for these averages was found across the range of inventor patent output. No significant decline of patent quality with increased yearly patent output was observed.

? Sen, S.K. and Kundra, R. (1986), Bibliometrics of English-language alcohol fuel literature: A new empirical-equation of scatter. *Scientometrics*, **10** (1-2), 43-54.

Full Text: [1986\Scientometrics10, 43.pdf](1986/Scientometrics10,%2043.pdf)

Abstract: 1460 items of literature in English on alcohol fuel, both technical and non-technical between 1901 and 1980 (only first quarter) collected and published as a bibliography by NAFIC, SERI (USA) were analysed. It was found that the growth pattern is befitting qualitatively with the epidemic growth model. Of the 1460 items, 828 are scattered in 288 journals. The pattern of scatter has been fitted in an empirical formula, a linear equation of the form *R(r)---ar-b,* where *R(r) is* the Mean Relative Scatter (MRS) of the articles over a class of ranked journals in increasing productivity and r is the rank of the class, a and b ate the arbitary constants. The formula, ff deductively established, can serve as an effective alternative to Bradford’s law.

Keywords: Bibliometrics

? Egghe, L. (1986), On the 80/20 rule. *Scientometrics*, **10** (1-2), 55-68.

Full Text: [1986\Scientometrics10, 55.pdf](1986/Scientometrics10,%2055.pdf)

Abstract: In a recent paper1 *Burrell* shows that libraries with lower average borrowings tend to require a larger proportion of their collections to account for 80% of the borrowings, than those with higher average borrowings. In that study, the underlying frequency distribution was a negative binomial. We are dealing with a case when the underlying distribution is of Lotka type. It is also shown that the ‘80/20-effect’ is much stronger in this case.

? Persson, O. (1986), Online bibliometrics: A research tool for every man. *Scientometrics*, **10** (1-2), 69-75.

Full Text: [1986\Scientometrics10, 69.pdf](1986/Scientometrics10,%2069.pdf)

Abstract: A method of using of commonly available online services for bibliometric studies is demonstrated. Distributions of papers by subfield, time, author and journal can be generated almost instantly and at very low cost. This article gives information on how to perform such studies.

Keywords: Bibliometrics

? Guay, Y. (1986), Emergence of basic research on the periphery: Organic-chemistry in India, 1907-1926. *Scientometrics*, **10** (1-2), 77-94.

Full Text: [1986\Scientometrics10, 77.pdf](1986/Scientometrics10,%2077.pdf)

Abstract: This study is a quantitative survey of the emergence of organic chemistry in India during the first two decades covered by *Chernical Abstracts.* Chemists that were conducting research in this country were separated in three distincts groups, on the basis of their cultural identity and of their educational background. Important disparities between these three groups have been stated, both in terms of research fields and in terms of publication outlets.

Keywords: India

? Small, H. and Greenlee, E. (1986), Collagen research in the 1970a. *Scientometrics*, **10** (1-2), 95-117.

Full Text: [1986\Scientometrics10, 95.pdf](1986/Scientometrics10,%2095.pdf)

Abstract: The specialty of collagen research is tracked over a ten year period, 1970-1979, using the methodology of co-citation duster strings. Independently obtained annual clusters are linked together over time by the percentage of highly cited documents countinuing from year to year. All inter-year links are clustered by single-linkage to form the strings, one of which corresponds to the collagen specialty. Maps of the individual year clusters within the string reveal an alternating pattern of expansion/innovation followed by contraction/consolidation. *At* the same time the subject focus of research gradually shifts. The institutional affiliation and funding sources for highly cited documents show a trend from early dominance by a few institutions and sources to a multiplicity and collaboration of centers and sources later on, due in part to the migration of researchers from an initially dominant institution.

? Blanpied, W.A. (1986), Modern science and human-values: Lowrance, WW. *Scientometrics*, **10** (1-2), 119-121.

Full Text: [1986\Scientometrics10, 119.pdf](1986/Scientometrics10,%20119.pdf)

? Moravcsik, M.J. (1986), Space, time, and life: Nalimov, VV. *Scientometrics*, **10** (1-2), 121-123.

Full Text: [1986\Scientometrics10, 121.pdf](1986/Scientometrics10,%20121.pdf)

? Haitun, S.D. (1986), Problems of quantitative-analysis of scientific activities: The nonadditivity of data. 2. *Scientometrics*, **10** (3-4), 133-155.

Full Text: [1986\Scientometrics10, 133.pdf](1986/Scientometrics10,%20133.pdf)

Abstract: It is examined to what extent the corollaries of the earlier proposed solution to the non-additivity problem are urgent for modern quantitative science studies. The role of non-linear transformations of indicators and closed scales in these studies is discussed. The distribution statistics and the coefficients of intercormection are investigated for their additivity. The possibilities of empirical verification of the proposed conception of additivity are also considered.

? Vinkler, P. (1986), Evaluation of some methods for the relative assessment of scientific publications. *Scientometrics*, **10** (3-4), 157-177.

Full Text: [1986\Scientometrics10, 157.pdf](1986/Scientometrics10,%20157.pdf)

Abstract: Some bibliometric methods for the assessment of the publication activity of research units are discussed on the basis of impact factors and citations of papers. “Average subfield impact factor” of periodicals representing subfields in chemistry is suggested. This indicator characterizes the average citedness of a paper in a given subfield. Comparing the total sum of impact factors of corresponding periodicals divided by the number of papers published by a research team to the average subfield impact factor a “publication strategy” indicator can be derived. A new bibliometric indicator, “relative subfield impact”, is introduced which compares the number of citations received by papers of a research unit to the average subfield impact factor.

? Moravcsik, M.J. (1986), The classification of science and the science of classification. *Scientometrics*, **10** (3-4), 179-197.

Full Text: [1986\Scientometrics10, 179.pdf](1986/Scientometrics10,%20179.pdf)

Abstract: With a view toward a system of science indicators which is flexible, appropriate, and unambiguous, a brief discussion is given of the theory of classification. This is then applied to three situations arising in input indicators for science, and it is shown how the presently used formalism for such indicators could be improved and thus eliminate unnecessary disputes in the practical application of such indicators.

? Krauskopf, M., Pessot, R. and Vicuna, R. (1986), Science in Latin-America: How much and along what lines. *Scientometrics*, **10** (3-4), 199-206.

Full Text: [1986\Scientometrics10, 199.pdf](1986/Scientometrics10,%20199.pdf)

Abstract: Scientific output in the Caribbean and Latin American countries was studied examining the publications indexed by the Institute for Scientific Information which conform the mainstream literature. The growth patterns of the first-authors-publishing-scientific-papers coming from the five most productive countries of the region were determined. In addition, the scientific publications from each country of the region, as indexed in 1981, were classified per field. It was found that most of the research was done in the life sciences area. However, the small scientific output observed in all fields appears insufficient to assure a positive role of science for the best overall development of each individual society. This situation may reflect a lack of support for the progress of science in these countries and therefore political commitment towards this purpose is considered to be of particular importance.

Keywords: Latin America

? Mendez, A. and Gomez, I. (1986), The Spanish Scientific Productivity Through 8 International Databases. *Scientometrics*, **10** (3-4), 207-219.

Full Text: [1986\Scientometrics10, 207.pdf](1986/Scientometrics10,%20207.pdf)

Abstract: The publications by the Spanish scientists recorded in eight international databases in the years 1978 and 1983 are retrieved. Science indicators able to give a perception of the scientific productivity, the institutions involved, the habits of publishing in foreign or domestic journals and co-authorship are presented. The changes observed in these indicators in the two analysed years are examined and the trend in the evolution of the Spanish science is shown. The time delay in recording items by the databases and coverage of the Spanish journals are also studied.

? Riley, K. (1986), Episodes in ESP: A source and reference book on the development of english for science and technology - Swales, J. *Scientometrics*, **10** (3-4), 221-222.

Full Text: [1986\Scientometrics10, 221.pdf](1986/Scientometrics10,%20221.pdf)

? Multhauf, R.P. (1986), Transformation and tradition in the sciences essays in honor of Cohen, I. Bernard - Mendelsohn, E. *Scientometrics*, **10** (3-4), 222-223.

Full Text: [1986\Scientometrics10, 222.pdf](1986/Scientometrics10,%20222.pdf)

? Donovan, A. (1986), Chemistry in America, 1876-1976: Historical indicators: Thackray, A, Sturchio, JL, Carroll, PT, Bud, R. *Scientometrics*, **10** (3-4), 224-225.

Full Text: [1986\Scientometrics10, 224.pdf](1986/Scientometrics10,%20224.pdf)

? Sengupta, I.N. (1986), Three new parameters in bibliometric research and their application to rerank periodicals in the field of biochemistry. *Scientometrics*, **10** (5-6), 235-242.

Full Text: [1986\Scientometrics10, 235.pdf](1986/Scientometrics10,%20235.pdf)

Abstract: Ranking of scientific periodicals by the method of citation counting provides valuable information about the degree of importance of the ranked periodicals. But such lists suffer from some inherent limitations. This paper discusses various pitfalls of traditional ranking lists and suggests, as a remedial measure, three new bibliometric parameters, namely, (1) scientific interest of a journal in relation to total number of articles published, (2) compactness of information content in a scientific periodical, and (3) scientific value of the papers in relation to compactness of presentation. It is believed that these new parameters, whenever applied to any traditional ranking list, will help to identify the accurate positions of different scientific journals of the parent list in order of their usefulness and importance. As a case study these parameters have been applied to the first ten core journals of biochemistry identified earlier and a revised reranked order of the titles presented and discussed.

? Sengupta, I.N. (1986), Three new parameters in bibliometric research and their application to rerank periodicals in the field of biochemistry. *Scientometrics*, **10** (5-6), 235-242.

Full Text: [1986\Scientometrics10, 235.pdf](1986/Scientometrics10,%20235.pdf)

Abstract: Ranking of scientific periodicals by the method of citation counting provides valuable information about the degree of importance of the ranked periodicals. But such lists suffer from some inherent limitations. This paper discusses various pitfalls of traditional ranking lists and suggests, as a remedial measure, three new bibliometric parameters, namely, (1) scientific interest of a journal in relation to total number of articles published, (2) compactness of information content in a scientific periodical, and (3) scientific value of the papers in relation to compactness of presentation. It is believed that these new parameters, whenever applied to any traditional ranking list, will help to identify the accurate positions of different scientific journals of the parent list in order of their usefulness and importance. As a case study these parameters have been applied to the first ten core journals of biochemistry identified earlier and a revised reranked order of the titles presented and discussed.

? Lancaster, F.W., Porta, M.A., Plagenz, K., Szymborski, K. and Krebs, M. (1986), Factors influencing sources cited by scientists: A case-study for Cuba. *Scientometrics*, **10** (5-6), 243-257.

Full Text: [1986\Scientometrics10, 243.pdf](1986/Scientometrics10,%20243.pdf)

Abstract: A collection of 1316 articles authored by Cuban scientists and published in the period 1950 to 1983 was assembled. The 18 991 bibliographic references in these papers were examined to identify factors that might influence the sources cited by Cuban scientists over the entire period. Degree of collaboration, place of publication and subject matter were among the factors considered. The major objective was to study the effect that the change in political alignment of Cuba (from Western bloc to Eastern bloc influence) has had on the sources cited. It was found that citation to Eastern bloc countries has greatly increased in the period since Castro assumed power. However, no corresponding decline in citation to Western bloc countries can be discerned.

? Pravdic, N. and Oluicvukovic, V. (1986), Dual approach to multiple authorship in the study of collaboration scientific output relationship. *Scientometrics*, **10** (5-6), 259-280.

Full Text: [1986\Scientometrics10, 259.pdf](1986/Scientometrics10,%20259.pdf)

Abstract: This paper presents an empirical study of the relations between scientific output and collaboration performed on two scales: (1) an individual scale, for members of a study model, and (2) a group scale, for three samples varying in the level of productivity. The rank approach was applied in the preparation of the study model resulting in the selection of a set of the most prolific authors. In the course of that process, multiple authorship problem was solved by a dual approach, consisting of “normal count” and “modified straight count” procedures. As shown by the analysis of collaborative patterns, either on individual or on group scales, scientific output is highly dependent on the frequency of collaboration among the same authors. Expressed as “the collaboration measure”, it might serve as an indicator in comparative analyses of scientific productivity in a given field of science.

? Lange, L. (1986), Interactions between disciplines and countries in methodical preferences for empirical-research. *Scientometrics*, **10** (5-6), 281-295.

Full Text: [1986\Scientometrics10, 281.pdf](1986/Scientometrics10,%20281.pdf)

Abstract: Scientific results of empirical research depend on the methods used. The selection of empirical methods by scientists is not solely determined by the subject of research or by theory. Social and historical (in our investigation national) conditions also affect the application of methods. This hypothesis has been corroborated with the help of journals in psychology, psychiatry, and sociology from different countries. The national impact on method preference varies among these disciplines. Conclusions are drawn concerning the generalizability of empirical results beyond disciplines and beyond countries.

? Smart, J.C. and Bayer, A.E. (1986), Author collaboration and impact: A note on citation rates of single and multiple authored articles. *Scientometrics*, **10** (5-6), 297-305.

Full Text: [1986\Scientometrics10, 297.pdf](1986/Scientometrics10,%20297.pdf)

Abstract: The acceptance rate of articles which are collaboratively authored tends to be higher than that for single-authored papers, thereby suggesting a generally positive relationship between collaboration and quality. The analysis of ten-year citation rates of 270 randomly selected articles in three applied fields likewise shows a similar relationship, with somewhat higher citation frequencies for multi-authored papers than for single-authored ones. The relationships persist whether self-citations are included or excluded. However, these differences are not statistically significant for articles in clinical psychology or in educational measurement. Only multi-authored articles in management science show a statistically significant higher citation rate. Other aspects of the collaborative process and effects are discussed.

? Senter, R. (1986), A causal model of productivity in a research facility. *Scientometrics*, **10** (5-6), 307-328.

Full Text: [1986\Scientometrics10, 307.pdf](1986/Scientometrics10,%20307.pdf)

Abstract: The problem addressed concerns the conditions that foster productivity among natural scientists in a large research laboratory. We take several variables identified as important in two major perspectives in the literature on productivity, and use these variables to construct a causal model. Using path analysis, we test the model by employing data from a sample of 295 scientists working at an atomic research facility in West Germany. In general, educational level of the scientists has an important, positive impact on productivity, years of service has a varying and more modest positive effect. Rank of the scientist has an intermediate positive impact on productivity, psychological factors have a negligible effect. Finally, the influence the scientist has on his research endeavors has a modest positive impact on productivity.

? Balaban, A.T. (1987), Avramescu, Aurel (1903-1985). *Scientometrics*, **11** (1-2), 3-5.

Full Text: [1987\Scientometrics11, 3.pdf](1987/Scientometrics11,%203.pdf)

? Blauberg, I.V., Ignatyev, A.A., Mirsky, E.M., Sadovsky, V.N. and Uzdemir, A.P. (1987), Yablonsky, A.I. (1936-1986). *Scientometrics*, **11** (1-2), 7-8.

Full Text: [1987\Scientometrics11, 7.pdf](1987/Scientometrics11,%207.pdf)

Note: CCountry

? Braun, T., Glänzel, W. and Schubert, A. (1987), One more version of the facts and figures on publication output and relative citation impact of 107 countries 1978-1980. *Scientometrics*, **11** (1-2), 9-15.

Full Text: [1987\Scientometrics11, 9.pdf](1987/Scientometrics11,%209.pdf)

? Daniels, W.D. (1987), Choosing input indicators for research managers. *Scientometrics*, **11** (1-2), 17-25.

Full Text: [1987\Scientometrics11, 17.pdf](1987/Scientometrics11,%2017.pdf)

Abstract: This paper focusses on the use of input indicators as a planning tool for research planners and administrators in one research sector. It reviews the experience of a number of developing countries in attempting to develop such indicators for national agricultural research systems. It appears that the more commonality there is in the research subject and environment, the more disaggregated the input data, research managers would find useful. While the paper reviews only one research sector, it concludes with comments on the feasibility of using similar measures in other sectors.

? Eto, H. and Candelaria, P.M. (1987), Applicability of the Bradford distribution to international science and technology indicators. *Scientometrics*, **11** (1-2), 27-42.

Full Text: [1987\Scientometrics11, 27.pdf](1987/Scientometrics11,%2027.pdf)

Abstract: This is to assess the applicability of the Bradford distribution to an international science-technology indicators problem. The Bradford distribution which has been empirically known to be valid for the number of scientific articles on a given research topic across journals is applied to the number of scientific axticles in a given research field across nations. The Bradford distribution is herein found to provide information of the degree of scientifictechnological inequitability between advanced and latecomer nations and, more characteristically, a method for classification of nations into core, middle and peripheral classes with respect to their S&T selfreliance. This may suggest the usefulness of the Bradford distribution for anylsis of international science-technology indicators. Some theoretical discussions on mathematical properties of the Bradford distribution axe given.

? De Stefano, D.A. (1987), Citation analysis and adaptive radiation. *Scientometrics*, **11** (1-2), 43-51.

Full Text: [1987\Scientometrics11, 43.pdf](1987/Scientometrics11,%2043.pdf)

Abstract: Bibliometrics does not allow prediction of the duration of research fronts. Utilizing an analogy with the concept of adaptive radiation, this heuristic article suggests a technique which may permit a measure of predictability to bibliometrics.

? Destefano, D.A. (1987), Citation analysis and adaptive radiation. *Scientometrics*, **11** (1-2), 43-51

Full Text: [1987\Scientometrics11, 43.pdf](1987/Scientometrics11,%2043.pdf)

Abstract: Bibliometrics does not allow prediction of the duration of research fronts. Utilizing an analogy with the concept of adaPtive radiation, this heuristic artiele suggests a technique which may permit a measure of predictability to bibliometries.

? Moravcsik, M.J. (1987), In the beholder eye: A possible reinterpretation of velho results on brazilian agricultural-research. *Scientometrics*, **11** (1-2), 53-57.

Full Text: [1987\Scientometrics11, 53.pdf](1987/Scientometrics11,%2053.pdf)

Abstract: Using the data recently presented by Lea Velho on the citation rates in and on Brazilian agricultural journal articles, it is suggested that a given such paper is cited by the non-Brazilian scientific literature at the same rate as a paper written anywhere else in the world would be, and that is cited by other Brazilian papers very much mote than a paper elsewhere would be. These conclusions are surprizing in view of the prevailing conventional wisdom, and axe also exactly opposite to the conclusions Velho herseff derived from the same data.

? Velho, L. (1987), The author and the beholder: How paradigm commitments can influence the interpretation of research results. *Scientometrics*, **11** (1-2), 59-70.

Full Text: [1987\Scientometrics11, 59.pdf](1987/Scientometrics11,%2059.pdf)

Abstract: This article is a reply to Moravesik’s interpretation of my results on Brazilian agricultural research. The argument here is that publication and citation data obtained within a specific country can hardly be compared to those offered by international databases such as that of ISI. Furthermore, publication and citation data must he interpreted in the light of qualitative information if they are to be of any use for science policy. Finally, the conclusions drawn in my previous paper axe reinforced here by the supplying of additional information.

? Doreian, P. (1987), A revised measure of standing of journals in stratified networks. *Scientometrics*, **11** (1-2), 71-80.

Full Text: [1987\Scientometrics11, 71.pdf](1987/Scientometrics11,%2071.pdf)

Abstract: A modified index of journal standing in a stratified journal to journal citation network is proposed. The original index, generated through an application of input-output analysis, is used as the first step of an iterative procedure that converges on the new index. This index, an eiginveetor of the inverted matrix used in the input-output analysis, has improved validity and better distributional properties than the original index.

? Egghe, L. (1987), An exact calculation of Price Law for the Law of Lotka. *Scientometrics*, **11** (1-2), 81-97.

Full Text: [1987\Scientometrics11, 81.pdf](1987/Scientometrics11,%2081.pdf)

Abstract: Price’s law asserts - in its simpliest version - that x/~ authors produce half of the papers made by the total of N authors. More generally: the top Na(0<c~<l) authors produce a fraction 0 (0< 0 <1’) of the papers made by the total of N authors and the Price’s law says that 0 ~a. In this paper - using Lotka’s law - we prove a mathematical relationship of 0 in function of c~ and the parameter ~ (the mean number of papers per author) and investigate when *o~a.* More-over our reasoning uses the theory of the 80/20 rule as developed in: L. EGGHE, On the 80/20-rule, *Scientometrics,* 10 (1986) 55-68, thereby also showing the relation betwwen the 80/20-rules (being an arithmetical form of measuring elitarism) and Price’s law (being a geometric form of measuring elitarism).

Keywords: Lotka

? Puzikov, M.D. and Kasjanov, A.E. (1987), Quantitative estimation of big and little science interrelation. *Scientometrics*, **11** (1-2), 99-104.

Full Text: [1987\Scientometrics11, 99.pdf](1987/Scientometrics11,%2099.pdf)

Abstract: Qantitative analysis of the interrelation of “big” and “little” science on the example of Research and Development of higher education in the USA has been made. The difference in the growth rates of “big” and “little” science is explained with the help of scientometrie index of capital expenditures per researcher. An attempt has been made to compare the dynamics of efficiency of “big” and “little” science on the base of mean duration of a research project. Possibilities of an alternative index of a relative amount of preliminary researches (preprojects) are pointed out.

? Kranzberg, M. (1987), Capitalism, socialism, and technology: A comparative-study of Cuba and Jamaica - Edquist, C. *Scientometrics*, **11** (1-2), 105-107.

Full Text: [1987\Scientometrics11, 105.pdf](1987/Scientometrics11,%20105.pdf)

? Drew, D.E. (1987), Extending the Educational Ladder - the Changing Quality and Value of Postdoctoral Study - Zumeta,W. *Scientometrics*, **11** (1-2), 107-110.

Full Text: [1987\Scientometrics11, 107.pdf](1987/Scientometrics11,%20107.pdf)

? Yuthavong, Y. (1987), Science and technology indicators for development: Moritalou, H. *Scientometrics*, **11** (1-2), 110-111.

Full Text: Scientometrics11, 110

? Roche, M. (1987), Cultural imperialism and exact sciences: German expansion overseas 1900-1930 - Pyenson,l. *Scientometrics*, **11** (1-2), 112-113.

Full Text: [1987\Scientometrics11, 112.pdf](1987/Scientometrics11,%20112.pdf)

? Frame, J.D. (1987), Comments on Michael J*.* Moravcsik, recipient of the third Derek de Solla Price Award. *Scientometrics*, **11** (3-4), 125-126.

Full Text: [1987\Scientometrics11, 125.pdf](1987/Scientometrics11,%20125.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1987), One more version of the facts and figures on publication output and relative citation impact in the life sciences and chemistry 1978-1980. *Scientometrics*, **11** (3-4), 127-140.

Full Text: [1987\Scientometrics11, 127.pdf](1987/Scientometrics11,%20127.pdf)

? Pruthi, S., Nagpaul, P.S. and Nabi, S.A. (1987), Indicators of research planning: A comparative-study of research groups in 6 countries. *Scientometrics*, **11** (3-4), 141-161.

Full Text: [1987\Scientometrics11, 141.pdf](1987/Scientometrics11,%20141.pdf)

Abstract: In this paper, an attempt has been made to examine the characteristics of research planning at the microcosmic level of the research group in six countries-Argentina, Egypt, India, Republic of Korea, Poland and UkSSR. The paper focusses on the following aspects: (1) intrinsic and extrinsic factors influencing the choice of research themes and orientation of the research programme, (2) quality of research planning measured by dimensions, such as planning consistency, task-interdependence and prior contacts with potential users, and (3) pattern of funding of research groups. Variations in the characteristics of research planning and funding mechanisms in different institutional and socio-cultural settings (countries) have been examined.

? Kunz, M. (1987), Time spectra of patent information. *Scientometrics*, **11** (3-4), 163-173.

Full Text: [1987\Scientometrics11, 163.pdf](1987/Scientometrics11,%20163.pdf)

Abstract: Information spectra are defined as intervals between equivalent information events. Their relations to negative binomial and negative polynomial distributions and urn models are explained. Basic properties of empirical information spectra from patent literature axe shown and discussed in connection with Haitun’s views on Z type information distributions, Sichel’s GIGP model and Trofimenko’s study on formation and decay of author groups.

? Lipatov, Y.S. and Denisenko, L.V. (1987), Information flows in the subfields of multicomponent polymer systems and trends of their development. *Scientometrics*, **11** (3-4), 175-182.

Full Text: [1987\Scientometrics11, 175.pdf](1987/Scientometrics11,%20175.pdf)

Abstract: The behaviour of information flows in different subfields of muticomponent polymer systems was compared for the years 1979 and 1983. The classification used enabled the maximum information on the species of polymer compositions to concisely be recorded. It was established that the information flows in the subfields of multicomponent polymer systems obeyed the law of literature scatter. In 1979 and 1983 about half of the total number of papers dealt with two species of polymer compositions: homopolymer blends and filled homopolymers. About 40% of species described in publications of 1979 did not appear either in journals or in proceedings of 1983. But new species accounted for 60% of the information flow in 1983.

? Chen, Y.S. and Leimkuhler, F.F. (1987), Bradford’s law: An index approach. *Scientometrics*, **11** (3-4), 183-198.

Full Text: [1987\Scientometrics11, 183.pdf](1987/Scientometrics11,%20183.pdf)

Abstract: A rigorous analysis of Bradford’s law is made using an index for the observed values of the variables. Three important properties relating size and frequency are identified. Using, this approach, the shape of Bradford-type curves can be described in terms of three distinct regions and two shape parameters.

? Hall, D.H. (1987), The interface between geoscience and industry: A case-study of the interaction between research and the discovery and mining of ores for nuclear-fuels. *Scientometrics*, **11** (3-4), 199-216.

Full Text: [1987\Scientometrics11, 199.pdf](1987/Scientometrics11,%20199.pdf)

Abstract: The nuclear industry was used as a case history to examine the influences between science and industry. The nuclear resources aspect of the industry was chosen for study. A correlation is found among indicators of geoscienee research, exploration for uranium ores, production of uranium, and the general state of the industry. Some of the science-industry interfaces were identified as fruitful areas for further study, and a historical analysis of exploration technology shows that a scientific development engendered by the requirements of an early phase of the industry was key to later expansion in exploration and resources discovery.

? Rousseau, R. (1987), The Gozinto Theorem: Using citations to determine influences on a scientific publication. *Scientometrics*, **11** (3-4), 217-229.

Full Text: [1987\Scientometrics11, 217.pdf](1987/Scientometrics11,%20217.pdf)

Abstract: This paper gives a mathematical technique to study influences, using citations. Taking into account both the publications that have a direct influence and those that have an indirect influence, we obtain the total influence measure on a fixed paper.

? Trofimenko, A.P. (1987), Scientometric analysis of the development of nuclear-physics during the last 50 years. *Scientometrics*, **11** (3-4), 231-250.

Full Text: [1987\Scientometrics11, 231.pdf](1987/Scientometrics11,%20231.pdf)

Abstract: A new method for author groups formation and decay processes is proposed. With the help of a special mathematical model time distribution of authors and their publications was established and group productivity, composition and stability, annual change of the total number of short-term and long-term authors, their renovation etc. as well as the time dependence of these quantities was determined. Particularities of activity of authors working in puelear physics are investigated. It is shown that the most rapid development in this field took place in the pre-war years, it was at high level up to 1960 and then began to decrease. The method used permits to forecast the development of science and to analyse the activity of author units in particular scientific centers.

? Diamond, A.M. (1987), An optimal-control model of the life-cycle research productivity of scientists. *Scientometrics*, **11** (3-4), 251-253.

Full Text: [1987\Scientometrics11, 251.pdf](1987/Scientometrics11,%20251.pdf)

Abstract: A continuous time model using optimal control techniques is presented which implies that a scientist’s productivity will eventually decline with age. This implication is at variance with Cole’s empirical findings but is consistent with Diamond’s empirical findings.

? Moravcsik, M.J. (1987), Comments on Tibor Braun, recipient of the third Derek de Solla Price Award. *Scientometrics*, **11** (5-6), 263-264.

Full Text:[1987\Scientometrics11, 263.pdf](1987/Scientometrics11,%20263.pdf), [1987\Scientometrics11, 263a.pdf](1987/Scientometrics11,%20263a.pdf)

? Vanheeringen, A. and Dijkwel, P.A. (1987), The relationships between age, mobility and scientific productivity. 1. Effect of mobility on productivity. *Scientometrics*, **11** (5-6), 267-280.

Full Text: [1987\Scientometrics11, 267.pdf](1987/Scientometrics11,%20267.pdf)

Abstract: The main aim of this study is to estimate to what extent the productivity of researchers is influenced by their mobility. Based on emperical data of Dutch scientists it is shown that job mobility is a characteristic of productive scientists rather than a means to enhance productivity. Field mobility appears to stimulate productivity in the long run.

? Vanheeringen, A. and Dijkwel, P.A. (1987), The relationships between age, mobility and scientific productivity. 2. Effect of age on productivity. *Scientometrics*, **11** (5-6), 281-293.

Full Text: [1987\Scientometrics11, 281.pdf](1987/Scientometrics11,%20281.pdf)

Abstract: In this paper we show that it is theoretically impossible to draw empirically founded conclusions about the relation between age and productivity. Only the relation between age and productivity increase can be verified empirically. With this limitation in mind, a subsequent analysis of productivity data of Dutch physicists, chemists en economists, indicates that the growth rate of productivity is higher at ages under 35 than at ages over 35.

? Leydesdorff, L. (1987), Various methods for the mapping of science. *Scientometrics*, **11** (5-6), 295-324.

Full Text: [1987\Scientometrics11, 295.pdf](1987/Scientometrics11,%20295.pdf)

Abstract: The dynamic mapping of science using the data in the Science Citation Index was put on the research agenda of science studies by De Solla Price in the mid 1960s. Recently, proponents of ‘co-citation cluster analysis’ have claimed that in principle their methodology makes such mapping possible. The study examines this claim, both methodologically and theoretically, in relation to other means of mapping science. A detailed study of a co-citation map, its core documents’ citation patterns and the related journal structures, is presented. At these three levels of possible study of aggregates of citations, an analysis is pursued for the years 1978 to 1984. The many different statistical methods which are in use for the analysis of the respective datamatrices-such as cluster analysis, factor analysis and multidimensional scalling-are assessed with a view to their potential to contribute to a better understanding of the dynamics at the different levels in relation to each other. This will lead to some recommendations about methods to use and to avoid when we aim at a comprehensive mapping of science. Although the study is pursued at a formal and analytical level, in the conclusions an attempt is made to reflect on the results in terms of further substantial questions for the study of the dynamics of science.

? Vanraan, A.F.J. and Hartmann, D. (1987), The comparative impact of scientific publications and journals: Methods of measurement and graphical display. *Scientometrics*, **11** (5-6), 325-331.

Full Text: [1987\Scientometrics11, 325.pdf](1987/Scientometrics11,%20325.pdf)

Abstract: A method is presented to display the comparative impact of scientific publications relative to their ‘environment’ (e.g., journals). Furthermore, the method gives a new approach to the establishment of a journal’s impact as measured by received citations. Moreover, in this impact measurement a dffferentation between various types of publieatioias (editorials and letters, ‘normal’ papers, reviews, etc.) can be made. It is argued that the method presented is more useful for library and research evaluation policies than the ISI impact factor.

? Nederhof, A.J. and Vanraan, A.F.J. (1987), Peer-review and bibliometric indicators of scientific performance: A comparison of CUM Laude doctorates with ordinary doctorates in physics. *Scientometrics*, **11** (5-6), 333-350.

Full Text: [1987\Scientometrics11, 333.pdf](1987/Scientometrics11,%20333.pdf)

Abstract: Quality judgments of predominantly local senior scientists regarding the scientific performance of candidates for a doctorate degree in physics were compared to the non-local short-term and long-term impact of the work published by these candidates before and after graduation. It was hypothesized that publications of cum laude degree-holders (‘cumlaudes’), both shortly before and shortly after the award of the degree, would be higher cited both on the short and long run than publications of ‘ordinary’ degree-holders. Before graduation, cumlaudes were significantly more productive, as well as authors of more highly cited publications than ordinary doctorates. Publications authored by cumlaudes some years before their graduation received on the average more than twice as many citations as publications authored by non-cumlaudes. However, in particular for cumlaudes, productivity and impact decreased sharply in years after graduation. After graduation, cumlaudes continued to be more productive than non-cumlaudes, but the impact of their publications equalled those produced by non-cumlaudes. The results offer little evidence for the Matthew effect and the Ortega hypothesis, but support the validity of both peer review outcomes and bibliometric impact assessments of scientific performance.

? Tijseen, R.J.W., Deleeuw, J. and Vanraan, A.F.J. (1987), Quasi-correspondence analysis on scientometric transaction matrices. *Scientometrics*, **11** (5-6), 351-366.

Full Text: [1987\Scientometrics11, 351.pdf](1987/Scientometrics11,%20351.pdf)

Abstract: In principle, a scientometric transaction matrix can be modelled by assuming that the number of transactions is the result of independent row and column contributions. More often one is primarily interested in the cross-structural relations between the participating entities, whereas the row and column margintls are of lesser or no importance. The values of the residuals after fitting an independence model to a complete transaction matrix can be analyzed by correspondence analysis to investigate the structure of the transactions between the rows and columns, after correcting for their marginal tiequencies. Recently a modification of correspondence analysis has been developed, quasi-correspondence analysis, which seems quite suitable for the analysis of citation-based transaction matrices which are incomplete or in which the incorporation of certain transactions may seem inappropriate, An illustration of both data analysis-techniques will be given using a journal-to-journal citation matrix.

? Braun, T., Glänzel, W. and Schubert, A. (1987), One more version of the facts and figures on publication output and relative citation impact in physics and mathematics 1978-1980. *Scientometrics*, **12** (1-2), 3-16.

Full Text: [1987\Scientometrics12, 3.pdf](1987/Scientometrics12,%203.pdf)

? Prabha, C.G. and Lancaster, F.W. (1987), Comparing the scatter of citing and cited literature. *Scientometrics*, **12** (1-2), 17-32.

Full Text: [1987\Scientometrics12, 17.pdf](1987/Scientometrics12,%2017.pdf)

Abstract: Using the subjects desalination and educational psychology, the scatter of periodical articles over periodical titles was compared at two levels, the second level being a random sample of periodical articles cited by the first level. Several measures were used to compare the extent of scatter at the two levels. Some methods commonly used in bibliometrics produced conflicting evidence on whether the citing literature (first-level) or the cited (second-level) was more scattered. A computer-intensive sampling procedure, known as the Bootstrap method, was then used to estimate the scatter of the total cited population from the scatter of the empirical sample. Cumulative distributions were prepared to show what percentage of periodicals accounted for various percentages of articles at each level of scatter. Only at the 90th percentile of articles did the percentage of periodical titles in the cited literature significantly exceed that of the citing literature. At the tail-end of the Bradford-type distribution, the cited literature appears to be more scattered than the literature citing it.

Keywords: Hungary, Mexico

Notes: MModel

? Gupta, D.K. (1987), Lotka’s law and productivity patterns of entomological research in Nigeria for the period, 1900-1973. *Scientometrics*, **12** (1-2), 33-46.

Full Text: [1987\Scientometrics12, 33.pdf](1987/Scientometrics12,%2033.pdf)

Abstract: A bibliography of entomological research in Nigeria, 1900-1973 totally 1720 publications was analysed to study the author productivity patterns and to test the applicability of Lotka~s law for the obtained distributions. Four different files’ were generated, one for the publications of all the authors, second for the publications by first authors, third for single authors and fourth for coauthors. Lotka’s law in its original form as inverse square law does not apply to any of the four data sets. However, it does apply in its generalised form with the calculated values of characteristic exponent c~. The values of a were found to be 1.9, 1.8, 2.2 and 2.4 for the four different data sets. K - S statistical test was aplied to test the applicability of generalised form of Lotka’s law. The maximum difference in the observed and estimated values of the proportions of authors was found to be highly insignificant at 0.01 level of significance in each of the four cases.

Keywords: Lotka, Nigeria

? Vinkler, P. (1987), A quasi-quantitative citation model. *Scientometrics*, **12** (1-2), 47-72.

Full Text: [1987\Scientometrics12, 47.pdf](1987/Scientometrics12,%2047.pdf)

Abstract: On the basis of investigating author’s opinion on citing motivations of chemistry papers a quasi.quantitative model for citing is suggested. The model selects professional and nonprofessional motivations of citing and introduces the citation threshold concept which tries to characterize the effect of citing motivations quantitatively. Possible reasons for missing citations are also treated. Mean ages of real and of self-citations were calculated by subtracting the average of the publication years of cited papers from the publication year of the citing publication. The difference between the mean ages may characterize the synehronity of the author’s research in comparison with those working on similar topics. The paper introduces the citation strategy indicator which relates impact factors of cited periodicals with the mean impact factor of periodicals in the corresponding research subfield.

? Russell, J.M., Mendoza, M. and Martinez, G. (1987), Patterns of literature citation by undergraduate students and researchers in the veterinary field. *Scientometrics*, **12** (1-2), 73-80.

Full Text: [1987\Scientometrics12, 73.pdf](1987/Scientometrics12,%2073.pdf)

Abstract: A comparative analysis carded out on tile literature citation characteristics of two sets of Mexican research documents produced in the veterinary field-the undergraduate thesis and the research journal article-revealed distinct patterns of literature usage on the part of the authors. It is suggested that the differences reflect the relative qualities of the research undertaken by two populations with distinct research competence and experience.

? Mendez, A., Gomez, I., Fernandez, M.T. and Aguado, G.L. (1987), 6 years of spanish scientific activity in physics and engineering through inspec and compendex. *Scientometrics*, **12** (1-2), 81-100.

Full Text: [1987\Scientometrics12, 81.pdf](1987/Scientometrics12,%2081.pdf)

Abstract: This study is an analysis of six years of Spanish bibliography retrieved from INSPEC and COMPENDEX. The quantitative evolution of the scientific activity by years and Institutions, the recent tendencies to publish in foreign journals, as well as to have the papers signed by more authors are followed. The most frequently used journals are ranked according to their impact factor and subject. Some hypothesis are formulated and tested, trying to find a relationship between the growth of the Spanish scientific activity and its quality.

? Shaw, J.G. (1987), Article-by-article citation analysis of medical journals. *Scientometrics*, **12** (1-2), 101-110.

Full Text: [1987\Scientometrics12, 101.pdf](1987/Scientometrics12,%20101.pdf)

Abstract: An article by article analysis produced by ISI has been investigated to see whether this form of feedback might be useful to the editors. The data highlight the different roles of two medical journals, which axe often regarded as similar. They also allow a parallel examination of the citation pattern of other items besides the standard scientific reseaxeh articles.

? Brunk, G.G. and Demack, G. (1987), Short-run trends in United-States patent activity. *Scientometrics*, **12** (1-2), 111-133.

Full Text: [1987\Scientometrics12, 111.pdf](1987/Scientometrics12,%20111.pdf)

Abstract: We examine a newly created data series consisting of the monthly number of American patents granted since 1853. An initial examination divides the series into four time periods. An analysis of short-run cycles demonstrates that the same Box-Jenkins model is not applicable to all four periods. Differences in nineteenth and twentieth century model parameters may be a result of frequent bureaucratic reinterpretations of America’s patent law during the last century, or-as many have claimed-may repsesent changes in the process of innovation itself over time. Our findings suggest that future researchers discriminate between two periods in their analyses. The first lasts until the late 1870’s, during which time there was a very high variability in the number of patents issued. Since the late 1870’s there has been a substantial decline in variability, and the amount of variance that can be explained by a simple Box-Jenkins model has increased. Still, not much variation can be explained using short-run cycles, and longer cycles appear to be both time period specific and highly unstable. The dynamics of American inventive activity are complex, and inventive activity appears t o be largely driven by exogenous factors such as wars, economic conditions and changes in governmental policy, rather than by its own internal dynamics.

Keywords: United States

? Frame, J.D. and Narin, F. (1987), The growth of Chinese scientific-research, 1973-84. *Scientometrics*, **12** (1-2), 135-144.

Full Text: [1987\Scientometrics12, 135.pdf](1987/Scientometrics12,%20135.pdf)

Abstract: During the Cultural Revolution (1966-1976), scientific work came to a halt in China. Universities closed, primary and secondary school education shut down, and intellectuals (including scientists and engineers) were sent to the countryside or to factories to work. The effects of the Cultural Revolution are reflected in China’s output of scientific literature. In 1973, for example, only one Chinese paper appeared in any of the world’s 2300 most central journals covered by the *Science Citation Index.* After restrictive policies were loosened, however, scientific papers grew exponentially. By 1982, only six years after the Cnltural Revolution ended, Chinese scientists produced 932 papers. This exponential growth of papers leveled off at this point and the number of papers appearing in the core 2300 journal stood at approximately 1000 in 1983 and 1984.

Keywords: Chinese

? Stefaniak, B. (1987), Use of Bibliographic databases for scientometric studies. *Scientometrics*, **12** (3-4), 149-161.

Full Text: [1987\Scientometrics12, 149.pdf](1987/Scientometrics12,%20149.pdf)

Abstract: The paper is a review of different applications of various bibliographic data bases to bibliometrie and scientometrie research such as identifying the leading journals in certain fields, investigating the structure and development of particular fields including trend analysis and foreeasting~ as well as the study of the contribution of various countries to world science as reflected in scientific literature presented in information f’des. The paper also covers the results of investigation of Polish scientific literature, as presented in the foreign data bases, in the fields of information science (LISA, ISA, INSPEC, 1977-1983), chemistry (CASeareh, 1978-1985), physics (INSPEC, 1979-1985), science-various disciplines (SCISEARCH, 1980-1984), Along with many advantages of using bibliographic data bases for seientometrie research some limitations are also described which may originate in data bases content, and have to be taken into account while designing such a type of investigation.

? Bialon, L. (1987), Research-and-development potential of Polish industry. *Scientometrics*, **12** (3-4), 163-177.

Full Text: [1987\Scientometrics12, 163.pdf](1987/Scientometrics12,%20163.pdf)

Abstract: The paper presents the methodology of investigating research intensity as well as the results of empirical investigation of Polish industry. The result of the analysis is the classification of industries according to their research intensity. The author indicates also that this type of analysis can be applied for planning development of industry.

? Jakubowski, A., Kulikowski, R. and Wagner, D. (1987), Allocation of research funds in competitive environment: A computerized negotiation system. *Scientometrics*, **12** (3-4), 179-196.

Full Text: [1987\Scientometrics12, 179.pdf](1987/Scientometrics12,%20179.pdf)

Abstract: The paper is concerned with the problem of financing of complex research programs. One of tasks to be solved consists in assigning research teams, willing to participate in a given program, to research projects being its elements, under conditions of constrained, budget. It is assumed that the strategy of every research team head is to maximize the average time-discounted income per person. In the previous paper of the authors a special negotiation procedure has been proposed to solve this problem. This paper presents some possible extensions and modifications of the procedure. At each stage of this procedure the heads of research teams involved have to make decisions on the assignment of their workers to particular projects. The proposed system of interactions among the research teams heads provides a possibility of reaching the eonsemus in the matter of this assignment. Simultaneously, it makes possible to solve the problem of research funds alloeation Such a system is considered as a multiperson game of Nash type with the non-zero sum of the players payments.

? Kot, S.M. (1987), The stochastic-model of evolution of scientific disciplines. *Scientometrics*, **12** (3-4), 197-205.

Full Text: [1987\Scientometrics12, 197.pdf](1987/Scientometrics12,%20197.pdf)

Abstract: In the paper science is regarded as a self-adapting system consisting of two subsystems. The stochastic model of one of the subsystems is proposed. The model reflects changes of the structure of a scientific discipline. As an example a model for the physics of elementary particles is presented.

? Lewickastrzalecka, A. (1987), Dynamics and structure of systems science. *Scientometrics*, **12** (3-4), 207-219.

Full Text: [1987\Scientometrics12, 207.pdf](1987/Scientometrics12,%20207.pdf)

Abstract: Systems science constitutes a specially difficult object of analysis as it is wide, interdisciplinary and shows ambiguity of notions and terms. These difficulties may be mastered, at least to some extent, with the aid of the analysis of the bibliographic citations system enabling a thorough study of the dynamics and structure of systems science, This paper presents the results of such analysis, Papers presented in Vienna at the Seventh European Meeting on Cybernetics and Systems Research (1984) formed the material, the analyses were made on.

? Okrasa, W. (1987), Differences in scientific productivity of research units: Measurement and analysis of output inequality. *Scientometrics*, **12** (3-4), 221-239.

Full Text: [1987\Scientometrics12, 221.pdf](1987/Scientometrics12,%20221.pdf)

Abstract: Three aspects of inequalities in scientific productivity of research units-scientists within RUs, RUs in the full sample and its cross-section, and an aggregate approach, in which components referring to the first two types of inequality were distinguished-was used to analyse the causes underlying unequall productivity. Using inequality measure basedon the theory of information (Theil measure) an inverse relationship between volume of produetivity and its inequality was empirically found both within research units and among RUs of a given organizitional system. Therefore identifying the sources of variability of output inequalities may be helpful in drawing conclusions regarding to the absolute volumes of scientific productivity of RUs.

Notes: UUniversity

? Sitarska, A. (1987), Scientometrics and bibliometrics in the Warsaw University curriculum of library and information science: Place and field structure. *Scientometrics*, **12** (3-4), 241-257.

Full Text: [1987\Scientometrics12, 241.pdf](1987/Scientometrics12,%20241.pdf)

Abstract: The paper describes the curriculum subject matter and its placement in the didactic processes at the Institute of Library and Information Science (Instytut Bibliotekoznawstwa i Informacji Naukowej IBIN) at the Warsaw University comparing some elements with other academic schools in Poland. Bibliographic traditions, and traditions in teaching the history of science are indicated as the basis for the present state of affairs. In addition to the discussion of classes and topics dealing with bibliometfies and seientometries, also problems of reading list repertoire and subject matter of research work, connected with the didactic activity considered, are discussed. In the conclusions it is stated that inadequate explicitness of the scope and object of bibliometries bears on the dispersion and lack of self-subsistence of bibliometries substance.

Keywords: Bibliometrics, Scientometrics

? Schubert, A., Glänzel, W. and Braun, T. (1987), Subject field characteristic citation scores and scales for assessing research performance. *Scientometrics*, **12** (5-6), 267-291.

Full Text: [1987\Scientometrics12, 267.pdf](1987/Scientometrics12,%20267.pdf)

? Macroberts, M.H. and Macroberts, B.R. (1987), Testing the Ortega hypothesis: Facts and artifacts. *Scientometrics*, **12** (5-6), 293-295.

Full Text: [1987\Scientometrics12, 293.pdf](1987/Scientometrics12,%20293.pdf)

Abstract: We examine the assumptions and data base used by researchers who have tested the Ortega hypothesis. We find that the assumptions are not supported by the data and that the data are faulty. We conclude that the results are artifactual. We recommend that any policy implemented on the basis of this research be suspended.

? Line, M.B. (1987), The shoulders of giants, or the backs of mice. *Scientometrics*, **12** (5-6), 297-298.

Full Text: [1987\Scientometrics12, 297.pdf](1987/Scientometrics12,%20297.pdf)

? Moravcsik, M.J. (1987), We must ask questions before giving answers. *Scientometrics*, **12** (5-6), 299-301.

Full Text: [1987\Scientometrics12, 299.pdf](1987/Scientometrics12,%20299.pdf)

? Nalimov, V.V. (1987), Scientists are not acrobats. *Scientometrics*, **12** (5-6), 303-304.

Full Text: [1987\Scientometrics12, 303.pdf](1987/Scientometrics12,%20303.pdf)

? Leydesdorff, L. (1987), Towards a theory of citation. *Scientometrics*, **12** (5-6), 305-309.

Full Text: [1987\Scientometrics12, 305.pdf](1987/Scientometrics12,%20305.pdf)

? Snizek, W.E. (1987), In search of influence: The testing of the ortega hypothesis. *Scientometrics*, **12** (5-6), 311-314.

Full Text: [1987\Scientometrics12, 311.pdf](1987/Scientometrics12,%20311.pdf)

? Meadows, A.J. (1987), Ortega hypothesis. *Scientometrics*, **12** (5-6), 315-316.

Full Text: [1987\Scientometrics12, 315.pdf](1987/Scientometrics12,%20315.pdf)

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Full Text: [1987\Scientometrics12, 317.pdf](1987/Scientometrics12,%20317.pdf)

? Lawani, S.M. (1987), The ortega hypothesis, individual-differences, and cumulative advantage. *Scientometrics*, **12** (5-6), 321-323.

Full Text: [1987\Scientometrics12, 321.pdf](1987/Scientometrics12,%20321.pdf)

? Nederhof, A.J. and Vanraan, A.F.J. (1987), Citation theory and the Ortega hypothesis. *Scientometrics*, **12** (5-6), 325-328.

Full Text: [1987\Scientometrics12, 325.pdf](1987/Scientometrics12,%20325.pdf)

? Zuckerman, H. (1987), Citation analysis and the complex problem of intellectual influence. *Scientometrics*, **12** (5-6), 329-338.

Full Text: [1987\Scientometrics12, 329.pdf](1987/Scientometrics12,%20329.pdf)

? Nalimov, V.V. (1987), Scientists are not acrobats. *Scientometrics*, **12** (5-6), 303-304.

Full Text: [1987\Scientometrics12, 303.pdf](1987/Scientometrics12,%20303.pdf)

? Leydesdorff, L. (1987), Towards a theory of citation. *Scientometrics*, **12** (5-6), 305-309.

Full Text: [1987\Scientometrics12, 305.pdf](1987/Scientometrics12,%20305.pdf)

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Full Text: [1987\Scientometrics12, 311.pdf](1987/Scientometrics12,%20311.pdf)

? Meadows, A.J. (1987), Ortega hypothesis. *Scientometrics*, **12** (5-6), 315-316.

Full Text: [1987\Scientometrics12, 315.pdf](1987/Scientometrics12,%20315.pdf)

? Oromaner, M. (1987), Ortega, obliteration and policy consequences. *Scientometrics*, **12** (5-6), 317-319.

Full Text: [1987\Scientometrics12, 317.pdf](1987/Scientometrics12,%20317.pdf)

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Full Text: [1987\Scientometrics12, 321.pdf](1987/Scientometrics12,%20321.pdf)

? Nederhof, A.J. and Vanraan, A.F.J. (1987), Citation theory and the Ortega hypothesis. *Scientometrics*, **12** (5-6), 325-328.

Full Text: [1987\Scientometrics12, 325.pdf](1987/Scientometrics12,%20325.pdf)

? Zuckerman, H. (1987), Citation analysis and the complex problem of intellectual influence. *Scientometrics*, **12** (5-6), 329-338.

Full Text: [1987\Scientometrics12, 329.pdf](1987/Scientometrics12,%20329.pdf)

? Small, H. (1987), The significance of bibliographic references. *Scientometrics*, **12** (5-6), 339-341.

Full Text: [1987\Scientometrics12, 339.pdf](1987/Scientometrics12,%20339.pdf)

? Narin, F. (1987), To believe or not to believe. *Scientometrics*, **12** (5-6), 343-344.

Full Text: [1987\Scientometrics12, 343.pdf](1987/Scientometrics12,%20343.pdf)

? Cole, S. and Cole, J.R. (1987), Testing the Ortega hypothesis: Milestone or millstone. *Scientometrics*, **12** (5-6), 345-353.

Full Text: [1987\Scientometrics12, 345.pdf](1987/Scientometrics12,%20345.pdf)

? Kretschmer, H. (1987), The adaptation of the cooperation structure to the research process and scientific performances in research groups. *Scientometrics*, **12** (5-6), 355-372.

Full Text: [1987\Scientometrics12, 355.pdf](1987/Scientometrics12,%20355.pdf)

Abstract: A theoretical approach was developed to raising the effectiveness of research groups as adaptable systems. If performance is the aim of the research group, adaptation to the changing conditions in the research process has to be one of its essential principles underlying its development. Empirically it was shown that several independent components of the cooperation structure that were simultaneously adapted to different changing conditions exerted a strong influence on performance. There is the hypothesis that the principle of adaptation of cooperation structure can be generally extended to the adaptation of other group characteristics.

? Broadus, R.N. (1987), Toward a definition of bibliometrics. *Scientometrics*, **12** (5-6), 373-379.

Full Text: [1987\Scientometrics12, 373.pdf](1987/Scientometrics12,%20373.pdf)

Abstract: The definitions of the term ‘bibliometrics’ as used in the literature are examined and evaluated. Most such definitions are held to be too broad. A new definition is proposed, then its advantages and possible defects pointed out. A crucial question is whether Zipf’s law of word occurrence should be considered a part of this particular sub-discipline.

Keywords: Bibliometrics

? Nordstrom, L.O. (1987), Applied versus basic science in the literature of plant biology: A bibliometric perspective. *Scientometrics*, **12** (5-6), 381-393.

Full Text: [1987\Scientometrics12, 381.pdf](1987/Scientometrics12,%20381.pdf)

Abstract: Applied and basic approaches to scientific inquiry were compared through a bibliometric analysis of two Canadian journals in plant biology. No differences were found between the journals in the distribution of citations aeross different sections of research articles (that is, Introduction, Methods, Results, and Discussion). Moreover, no contrasts were found in the frequency of multiple authorships or in the age distribution of cited works. However, the journals differed significantly on three other bibliometric measures: author affiliation, number of references per article, and publication format of cited works.

? Schubert, A. (1987), Quantitative studies of science a current bibliography. 10. *Scientometrics*, **12** (5-6), 395-412.

Full Text: [1987\Scientometrics12, 395.pdf](1987/Scientometrics12,%20395.pdf)

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Full Text: [1987\Scientometrics12, 413.pdf](1987/Scientometrics12,%20413.pdf)

? Jaccerino, V. (1987), Strengthening academic science: Drew, D. *Scientometrics*, **12** (5-6), 415-417.

Full Text: [1987\Scientometrics12, 415.pdf](1987/Scientometrics12,%20415.pdf)

? Braun, T. and Schubert, A. (1988), World flash on basic research: Scientometric versus socio-economic indicators - scatter plots for 51 countries - 1978-1980. *Scientometrics*, **13** (1-2), 1-9.

Full Text: Scientometrics13, 1.pdf

? Purica, I.I. (1988), Creativity, intelligence and synergetic processes in the development of science. *Scientometrics*, **13** (1-2), 11-24.

Full Text: [1988\Scientometrics13, 11.pdf](1988/Scientometrics13,%2011.pdf)

Abstract: It is shown that characterizing the creative activity by the “aha!” concept the creative processes can be described as singular points of a smooth surface. The cusp catastrophe from the theory of Ren Thorn is used to describe and to estimate quantitatively the creative process, The behaviour parameter is the flux of empirical laws and the control parameters are the experimental and the theoretical effort. The theoretical effort is the bifurcation parameter.

? Kunz, M. (1988), A case-study against Haituns conjectures. *Scientometrics*, **13** (1-2), 25-33.

Full Text: [1988\Scientometrics13, 25.pdf](1988/Scientometrics13,%2025.pdf)

Abstract: Haitun’s conjectures about specific properties of information distributions are questioned. It is shown on linguistic material that the opening of a closed counting scale changes the skewness of distribution in a way which contradicts Haitun’s suggestions. Negative power distributions are time dependent and can be explained as density measures of fraetal clusters and axe not specific to the social sciences.

? Haitun, S.D. (1988), A case-study against Haituns conjectures: Comment. *Scientometrics*, **13** (1-2), 35-44.

Full Text: [1988\Scientometrics13, 35.pdf](1988/Scientometrics13,%2035.pdf)

Abstract: M. Kunz’s criticism of the concept of non-Gaussian nature of scientific activities is discussed. The following points of the concept are analyzed: transformations of closed scales into open scales, the dependence of moments of non-Gauss/an distributions on the samples size, the non-Gaussian nature of Man-dwelt upon by Kunz. Arguments based on statistical analysis of Kunz’s article are put forward against Kunz.

? Nieuwenhuysen, P. and Rousseau, R. (1988), A quick and easy method to estimate the random effect on citation measures. *Scientometrics*, **13** (1-2), 45-52.

Full Text: [1988\Scientometrics13, 45.pdf](1988/Scientometrics13,%2045.pdf)

Abstract: A quick and easy method is presented to estimate the random fluctuations exhibited by citation measures. Applying this method allows for instance a better view on the ranking of journals (their so called “pecking order”), when the ranks are based on the number of recieved citations or on the impact factor of the journal.

? Wood, J.B. (1988), The growth of scholarship: An online bibliometric comparison of dissertations in the sciences and humanities. *Scientometrics*, **13** (1-2), 53-62.

Full Text: [1988\Scientometrics13, 53.pdf](1988/Scientometrics13,%2053.pdf)

Abstract: *The Dissertation Abstracts* database was searched online to study patterns in the growth of scholarship from 1880-1984. The total number of degrees granted per year as well as the number of degrees granted per year in the “hard” sciences, social sciences, and library science seems to be leveling off, the number in fine arts and literature has begun to decline, and the number in information science, computer science, and the health sciences continues to grow. Searching *Dissertation Abstracts* online offers an efficient and relatively inexpensive way to obtain quantitative data for trend analysis.

? Flor, A.G. (1988), The information wastage ratio: Towards a theory of rates of information generation and utilization. *Scientometrics*, **13** (1-2), 63-69.

Full Text: [1988\Scientometrics13, 63.pdf](1988/Scientometrics13,%2063.pdf)

Abstract: This paper presents a theoretical framework of the relationships between certain phenomena attendant to an information society, i.e, information explosion, societal informarion overload, etc. It also attempts to explain and predict the possible effects of these phenomena on information generation, utilization and wastage. A theory of rates of information generation and utilization as well as a wastage ratio is proposed, The initial propositions, axioms and postulates which form the bases of this theory are described in their logieai sequence. Hypotheses and conceptual models are also included.

? Vansteijn, F. and Rip, A. (1988), The role of trade literature in the communication-system. *Scientometrics*, **13** (3-4), 81-91.

Full Text: [1988\Scientometrics13, 81.pdf](1988/Scientometrics13,%2081.pdf)

Abstract: Bibliometrie methods in general undervalue technological research. This study examines the relation in literature between technological/industrial journals and scientifie journals in the ease of the plastics industry and polymer science. Trade-journals cannot be used in a straightforward bibliometric manner, but can be an aid in mapping the different groups and reveal the ‘hidden’ eornrnunieation between technological and scientific communities.

? Swales, J. (1988), Language and scientific communication: The case of the reprint request. *Scientometrics*, **13** (3-4), 93-101.

Full Text: [1988\Scientometrics13, 93.pdf](1988/Scientometrics13,%2093.pdf)

Abstract: This paper reports on a study of Reprint Requests (RRs). It is estimated that tens of millions of RRs are mailed each year, most being triggered by *Current Contents.* A sample of RRs generated by three papers, plus a quessionnaire-survey of the requesters for one paper, form the basis of this study into language use patterns in the RR genre. English is ubiquitous, German and French infrequent, Russian and Spanish rare. This language data is significant because it provides unit-level language decision making (as opposed to that at other levels). Various applications of RR research are discussed, including its relevance to the issue of “Third World Science”.

? Porter, A.L., Chubin, D.E. and Jin, X.Y. (1988), Citations and scientific progress: Comparing bibliometric measures with scientist judgments. *Scientometrics*, **13** (3-4), 103-124.

Full Text: [1988\Scientometrics13, 103.pdf](1988/Scientometrics13,%20103.pdf)

Abstract: This project compares various bibliometric measures and scientists’ own judgments. Publication and citation data are compiled for two cohorts of chemists awarded Sloan Fellowships. Citation patterns differ substantially between most cited papers and those these authors identify as their “best.” Theoretical, empirical, and methodological papers are contrasted as well. In addition, temporal citation patterns show that recognition spreads beyond the research area of a particular paper to yield “cross-disciplinary” citation .surprisingly rapidly. Results suggest the utility of studying citation patterns among the Institute for Scientific Information Subject Categories, but also caution against equating publication and citation counts with scientific progress.

? Kaneiwa, K., Adachi, J., Aoki, M., Masuda, T., Midorikawa, N., Tanimura, A. and Yamazaki, S. (1988), A comparison between the journals nature and science. *Scientometrics*, **13** (3-4), 125-133.

Full Text: [1988\Scientometrics13, 125.pdf](1988/Scientometrics13,%20125.pdf)

Abstract: In this paper, Nature and Science, the two distinguished multi-disciplimuary scientific journals were compared placing emphasis on their internationality. The items investion ml were as follows. A. general comparison: 1. number of authors per article, 2. di~ilmtiw a’ countries to which first authors’ imtitutions belong, 3. distn~oution of main diSCilflJm studied by first authors, 4. time-lag between the date of receipt of an azticle by the and the date of its publication. B. the position with regard to Japanese authors: 1. Numbtt of Japanese authors, 2. relationship between the ranking of a Japanese author in the list of authors’ names and the country where his institution is located, 3. relationship between the time-lag stated in A-4 and the items stated in B-2. As a result, it can be said tlmtNature is a more highly international journal then Science.

? Herrmann, D.B. (1988), How old were the authors of significant research in 20th-century astronomy at the time of their greatest achievements. *Scientometrics*, **13** (3-4), 135-137.

Full Text: [1988\Scientometrics13, 135.pdf](1988/Scientometrics13,%20135.pdf)

Abstract: This paper examines the contributions given in the *Source Book in Astronomy and Astrophysics 1900-1975* with respect to the question: how old were the authors at the time of their greatest achievements? As average value of the age of the authors at the time of the publication we find A = 39.8±10.9 years and a tittle difference for more empirical and the theoretical papers.

? Schubert, A. (1988), Quantitative studies of science: A current bibliography. *Scientometrics*, **13** (3-4), 139-172.

Full Text: [1988\Scientometrics13, 139.pdf](1988/Scientometrics13,%20139.pdf)

? Lyon, W.S. (1988), Survival strategies for new scientists: Sindermann, CJ. *Scientometrics*, **13** (3-4), 173.

Full Text: [1988\Scientometrics13, 173.pdf](1988/Scientometrics13,%20173.pdf)

? Martin, B.R. (1988), History of CERN, Volume 1: Hermann, A, Krige, J, Mersits, U, Pestre, D. *Scientometrics*, **13** (3-4), 174-175.

Full Text: [1988\Scientometrics13, 174.pdf](1988/Scientometrics13,%20174.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1988), World flash on basic research: The newest version of the facts and figures on publication output and relative citation impact of 100 countries 1981-1985. *Scientometrics*, **13** (5-6), 181-188.

Full Text: [1988\Scientometrics13, 181.pdf](1988/Scientometrics13,%20181.pdf)

? Guay, Y. (1988), Internationalization of industrial-research: The pharmaceutical-industry 1965-1979. *Scientometrics*, **13** (5-6), 189-213.

Full Text: [1988\Scientometrics13, 189.pdf](1988/Scientometrics13,%20189.pdf)

Abstract: This study is a count of the publications of a sample of the major pharmaceutical multinational companies. These finns have been divided into three geopolitical groups: Europe, the United States and Japan. Results obtained show that research activities in this industry have been subjected to some changes between 1965 and 1979. Among these changes is the growing importance of fundamental research, the erosion of the leadership of U.S.-based firms and the growing importance of overseas research.

? Over, R. (1988), Does scholarly impact decline with age. *Scientometrics*, **13** (5-6), 215-223.

Full Text: [1988\Scientometrics13, 215.pdf](1988/Scientometrics13,%20215.pdf)

Abstract: Relationships between age and scholarly impact were assessed by determining the number of times single-author articles (N=227) published in Psychological Review between 1965 and 1980 were cited in the fifth year following publication. There were substantial individual differences in citation rates, but this measure of scholarly impact did not correlate with either the chronological age of authors or their professional age (years since PhD award). Although the majority of articles in Psychological Review were published by authors under the age of 40, such a bias is to be expected in terms of the age distrubution of American psychologists. When allowance was made for the number of authors in different age ranges, older authors were no less likely than younger authors to have generated a high-impact article (an article cited 10 or more times in the fifth year after publication). The data offer no support to claims that publications by young scientists have greater impact.

Notes: UUniversity

? Ehikhamenor, F.A. (1988), Perceived state of science in Nigerian universities. *Scientometrics*, **13** (5-6), 225-238.

Full Text: [1988\Scientometrics13, 225.pdf](1988/Scientometrics13,%20225.pdf)

Abstract: Nigerian university scientists are working under very difficult conditions created by a nmnber of constaints of which lack of equipment and lack of information are the most crucial. These constraints have generated a number of adaptations that are both innovative and opportunistiy categies for dealing with these constraints are described. Attention is also given to the social milieu of the scientists and the issue of reward for scientific contribution.

? Vinkler, P. (1988), An attempt of surveying and classifying bibliometric indicators for scientometric purposes. *Scientometrics*, **13** (5-6), 239-259.

Full Text: [1988\Scientometrics13, 239.pdf](1988/Scientometrics13,%20239.pdf)

Abstract: An attempt is made for the survey and classification of bibliometric indicators applicable for assessment of publication performance of researchers active in natural sciences. Indicators can be classified as publication and citation ones which may refer to impact and quantity of publication activity of researcher(s), teams, institutes or eotmtties. Taking into account the possible reference standards, the indicators are classified as simple, specific, balance, distribution and relative ones. In order to evaluate publication activity both qualitatively and quantitatively, relative citation indicators can be recommended, which relate citations received to the sum of impact factors of the journals, where the papers were published or give the relative measure of the average eitedness of papers related to that of papers in journals in a similar subfield.

? Garg, K.C. and Rao, M.K.D. (1988), Bibliometric analysis of scientific productivity: A case-study of an Indian physics laboratory. *Scientometrics*, **13** (5-6), 261-269.

Full Text: [1988\Scientometrics13, 261.pdf](1988/Scientometrics13,%20261.pdf)

Abstract: The paper analyses the output of the publication data of an Indian laboratory in the field of physics in SCI and non SCI coveted Indian and foreign journals, processes developed and Indian patents filed during the period 1965 -82 to find out the pattern of productivity. Looks at the journals wherein the laboratccy scientists publish. Also points out the sub-areas of physics in which the laboratory scientists have published maximum papers and also mentions about the pattern of scientific co-authorship in the research work. Correlation coefficients between input variable (manpower and budget) with output variables (number of papers published, processes developed and Indian patents accepted) have been calculated.

? Eto, H. (1988), Rising tail in Bradford distribution: Its interpretation and application. *Scientometrics*, **13** (5-6), 271-287.

Full Text: [1988\Scientometrics13, 271.pdf](1988/Scientometrics13,%20271.pdf)

Abstract: The right tail of the Bradford distribution has been considered to be straight or drooping. This paper reports cases in which the right tail is rising upward, explains and verifies conditions of its occurrences, intcxpretes it and proposes its application to evaluation and forecasting of technological development at the basic research stage.

? Kunz, M. (1988), Lotka and Zipf: Paper dragons with fuzzy tails. *Scientometrics*, **13** (5-6), 289-297.

Full Text: [1988\Scientometrics13, 289.pdf](1988/Scientometrics13,%20289.pdf)

Abstract: A linear correlation exists between the Lotka frequency and Zipf rank distribution functions. Relatively good correlation coefficients were found, but slope constants are not consistent with theory. They show that information distributions are not homogeneous and cannot be completely described by two parameter functions.

Keywords: Lotka, Zipf

? Sangster, J. (1988), The history of sciences and scientists for the last 2 centuries from the viewpoint of leading academies or scientific societies - French - Decandolle, A. *Scientometrics*, **13** (5-6), 301-302.

Full Text: [1988\Scientometrics13, 301.pdf](1988/Scientometrics13,%20301.pdf)

? Bromley, D.A. (1988), Scientific excellence: Jackson, DN, Rushton, JP. *Scientometrics*, **13** (5-6), 302-303.

Full Text: [1988\Scientometrics13, 302.pdf](1988/Scientometrics13,%20302.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1988), The newest version of the facts and figures on publication output and relative citation impact in the life sciences and chemistry 1981-1985. *Scientometrics*, **14** (1-2), 3-15.

Full Text: [1988\Scientometrics14, 3.pdf](1988/Scientometrics14,%203.pdf)

? Jiménez, J., Hunya, P., Bayona, M. and Halász, A. (1988), The S and T potential of Mexico and Hungary. *Scientometrics*, **14** (1-2), 17-41.

Full Text: [1988\Scientometrics14, 17.pdf](1988/Scientometrics14,%2017.pdf)

Keywords: Hungary, Mexico

? Chakravarthy, R., Chawla, A. and Mehta, G. (1988), Women scientists at work: An international comparative-study of 6 countries. *Scientometrics*, **14** (1-2), 43-74.

Full Text: [1988\Scientometrics14, 43.pdf](1988/Scientometrics14,%2043.pdf)

Abstract: On the basis of survey, conducted within the framework of the UNESCO International Comparative Study on the Organization of Research groups, the role and position of women in scientific activity is compared. Data on a total of (6000 individuals) from Argentina, India, Egypt, Korea, Poland and USSR show that women scientists’ participation is highest in Poland, and lower in India, Korea and Argentina. Everywhere women scientists are more often doing the routine aspects of the research process and more isolated from external contacts with men. Women have lower scientific productivity than male scientists which can be interpreted as a consequence of their lower status in the organization.

? Lindsey, D. (1988), Assessing precision in the manuscript review process: A little better than a dice roll. *Scientometrics*, **14** (1-2), 75-82.

Full Text: [1988\Scientometrics14, 75.pdf](1988/Scientometrics14,%2075.pdf)

Arunachalam, S. and Manorama, K. (1988), How do journals on the periphery compare with mainstream scientific journals. *Scientometrics*, **14** (1-2), 83-95.

Full Text: [1988\Scientometrics14, 83.pdf](1988/Scientometrics14,%2083.pdf)

Abstract: Based on the premise that citations in scientific journals can tell us a lot about the journals, we have compared Indian journals in the fields of astronomy, physics, chemistry, biochemistry, geology and ecology with leading world journals.’The two criteria compared are the age of references and the journals often cited in each of the journals considered. Our results show that although overall Indian science is mediocre, parts of India’s scientific enterprise are cognitively better related to world science. The peripherality is not uniform across the board, but some areas like astronomy and to some extent physics are closer to the central or mainstream science than others. Although citation analysis is not normally used for cross-field comparisons, this paper demonstrates that, if used judiciously, citation analysis can yield valuable insights into issues involving many fields.

? Frey, B.S. and Pommerehne, W.W. (1988), The American domination among eminent economists. *Scientometrics*, **14** (1-2), 97-110.

Full Text: [1988\Scientometrics14, 97.pdf](1988/Scientometrics14,%2097.pdf)

Abstract: American economists take a dominant position among eminent economists. According to Blaug’s Who’s Who in Economics, among iiving economists the share amounts to more than two thirds, and over one half of all eminent economists since 1700. Part of this dominance may be attributed to factors such as the definition of ‘eminence’, the underlying sample of scholars, and the language and style representing barriers to entry for non-American economists. However, the major reason consists in the favourable conditions for good research which in turn are based on tbe beneficial economic, political and social framework existing in North America.

? Pravdic, N., Aganovicboras, A. and Kritovac, D. (1988), In search of a “non-citation index” indicator for scientific activity assessment in less developed-countries: Case study of Croatia/Yugoslavia. *Scientometrics*, **14** (1-2), 111-125.

Full Text: [1988\Scientometrics14, 111.pdf](1988/Scientometrics14,%20111.pdf)

Abstract: The meaning of the term the intellectual “island effect” which was introduced by Arunachalam et al. is broadened as to characterize the status of science on the periphery in general. A practical solution is proposed, based on bibliometric data of the research output and relying on two criteria: the extent of coverage by world significant secondary literature and the extent of scatter of that literature. Reliability of the publication data retrieved from the Citation Indexes is discussed, a measure is offered to assess the adequacy of the Citation Indexes as the data sources.

Keywords: Croatia, Yugoslavia

? Kidd, J.S. (1988), The popularization of science: Some basic measurements. *Scientometrics*, **14** (1-2), 127-142.

Full Text: [1988\Scientometrics14, 127.pdf](1988/Scientometrics14,%20127.pdf)

Abstract: Four pairs of articles provide a framework for the bibliometfic analysis of presentations of scientific findings to non-specialist audiences. One member of each pair is a professional-level review article, the other is its counterpart as published in Scientific American. Two of the pairs were published in the mid-1960’s and two pairs were published in the mid-1980’s. The pace and scope of popular reportage improved over the twenty-year span but the readability index for popular treatments suggests that there are still serious barriers to mass audience consumption. Examination of the personal references in the popular presentations reveals linkage patterns that are analogous to those found by citation and co-citation analyses.

? Onodera, N. (1988), A frequency distribution function derived from a stochastic model considering human behaviors and its comparison with an empirical bibliometric distribution. *Scientometrics*, **14** (1-2), 143-159.

Full Text: [1988\Scientometrics14, 143.pdf](1988/Scientometrics14,%20143.pdf)

Abstract: Simon’s stochastic model is extended to take both ‘selective’ and ‘random’ factors in human behaviors into consideration. The resulting distribution function is of ‘non-steady-state’ type and approaches the Poisson distribution at the random limit while the Yule (or Zipf) distribution at the selective limit. A comparison of the theoretical distribution with an observed one for classification items indexed in a bibliographic database is made. The results give some insights into statistical features of a class in which the total number of elements is fixed.

? Vinkler, P. (1988), Weighted impact of publications and relative contribution score: 2 new indicators characterizing publication activity of countries. *Scientometrics*, **14** (1-2), 161-163.

Full Text: [1988\Scientometrics14, 161.pdf](1988/Scientometrics14,%20161.pdf)

Abstract: In order to characterize the relative publication output of countries both qualitatively and quantitatively two indicators [Weighted Impact of Publications (WlP) and Relative Contribution Score (RCS)] are suggested. The RCS indicator may reflect the contribution of countries to the world science by inhabitants.

? Small, H. (1988), Mapping the dynamics of science and technology: Callon, M, Law, J, Rip, A. *Scientometrics*, **14** (1-2), 165-168.

Full Text: [1988\Scientometrics14, 165.pdf](1988/Scientometrics14,%20165.pdf)

? Healey, P., Irvine, J. and Martin, B.R. (1988), Introduction: Quantitative science-policy studies in the United Kingdom. *Scientometrics*, **14** (3-4), 177-183.

Full Text: [1988\Scientometrics14, 177.pdf](1988/Scientometrics14,%20177.pdf)

Keywords: United Kingdom

Note: CCountry

? Phillips, D.C. and Turney, J. (1988), Bibliometrics and UK science policy. *Scientometrics*, **14** (3-4), 185-200.

Full Text: [1988\Scientometrics14, 185.pdf](1988/Scientometrics14,%20185.pdf)

Keywords: Bibliometrics

? Collins, P.M.D. (1988), Research performance and migration: Two sepsu studies. *Scientometrics*, **14** (3-4), 201-211.

Full Text: [1988\Scientometrics14, 201.pdf](1988/Scientometrics14,%20201.pdf)

Abstract: This paper describes two recent studies by the Science and Engineering Policy Studies Unit (SEPSU). The first is a comparative evaluation of national performance in basic research - an exploration of methodology and extensive data on several facets of national performance. The second deals with the migration of scientists and: engineers to and from the UK, and reports a mote complex picture than some commentators had expected.

? Carpenter, M.P., Gibb, F., Harris, M., Irvine, J., Martin, B.R. and Narin, F. (1988), Bibliometric profiles for British Academic Institutions: An experiment to develop research output indicators. *Scientometrics*, **14** (3-4), 213-233.

Full Text: [1988\Scientometrics14, 213.pdf](1988/Scientometrics14,%20213.pdf)

Abstract: In this paper, we report the results of an exploratory study commissioned by the Advisory Board for the Research Councils to produce bibliometric research profiles for academic and related institutions within the UK. The approach adopted is based on the methodology developed by CHI Research whereby publications from a given institution ate weighted according to the influence of the journal in which they appear. Although certen technical limitations were encountered with the approach, the study nonetheless yielded potentially useful information on the comparative research output of British universities and polytechnics.

Keywords: Science

? Crewe, I. (1988), Reputation, research and reality: The Publication records of UK departments of politics, 1978-1984. *Scientometrics*, **14** (3-4), 235-250.

Full Text: [1988\Scientometrics14, 235.pdf](1988/Scientometrics14,%20235.pdf)

Abstract: This article contributes some data on the relative research performance of university departments, a topic of growing interest. It analyses the total published and per capita publication rates of 52 UK Politics Departments from 1978 to 1984. The main findings are that 1) departmental per capita publication rates vary enormously, 2) a department’s relative productivity is strongly correlated across all types of publication, 3) a few departments are substantially more productive then the rest, 4) among highly productive departments, one can usefully distinguish between those with ‘collective’ and those with ‘individual’ strength 5) a department’s productivity is not related to its size. Various rankings are compiled and compared .with the THES peer review and the UGC’s classification of research quality.

? Law, J., Bauin, S., Courtial, J.P. and Whittaker, J. (1988), Policy and the mapping of scientific change: A co-word analysis of research into environmental acidification. *Scientometrics*, **14** (3-4), 251-264.

Full Text: [1988\Scientometrics14, 251.pdf](1988/Scientometrics14,%20251.pdf)

Abstract: This paper describes recent developments in the co-word method and illustrates, for the ease of acid raha research, the way in which the method can be used to detect (a) the themes of research to be found in a given area of science, (b) the relationships between those themes, (c) the extent to which they are central to the area in question and (d) the degree to which they are internally structured. It is also suggested that the method may be used to draw comparative research profiles for different countries. Though the data used are only preliminiary, it is argued that the method has now been developed to the point where its results are both quite robust and easily assimilable. It is, accordingly, now an appropriate tool for policy analysis.

? Giusti, W.L. and Georghiou, L. (1988), The use of co-nomination analysis in real-time evaluation of an R&D program. *Scientometrics*, **14** (3-4), 265-281.

Full Text: [1988\Scientometrics14, 265.pdf](1988/Scientometrics14,%20265.pdf)

Abstract: This article describes the application of co-nomination analysis, a technique designed to nmp the structure of a research community. The technique was used as part of the evaluation of the UK national information technology programme, which sponsors collaborative research between firms and between firms and universities. Co-nomination networks are based upon responses to questionnaires in which researchers are asked to nominate other researchers whose work is simil~r or relevant to their own. Researchers nominated in the same response are presumed to be linked, and where these links occur with multiple frequency, the likelihood of their being significant is increased. The article describes the extension of a network which had been previously identified and compares the citation scores of researchers identified in the networks. It is concluded that the networks represented were realistic and a useful input to the evaluation. Industrial and government researchers with low citation score’s were in some cases central to the networks, suggesting that co-nomination is useful in areas where publication is restricted or considered less important. Further development of the technique is planed.

? Mcginnety, J.A. (1988), The Natural Environment Research Council (NERC): Recent experiences with quantitative science policy studies. *Scientometrics*, **14** (3-4), 283-293.

Full Text: [1988\Scientometrics14, 283.pdf](1988/Scientometrics14,%20283.pdf)

Abstract: NERC is exploring methods by which its management of research and science audit might be improved. Quantitative output indicators have been used to provide information for science audit at the levels of individuals and laboratories. Scientists in eleven laboratories described their research activities over five years and provided output indicators, including publications in the refereed and general literature. Citation counts and influence profiles were then prepared. The paper describes some comparisons between laboratories in similar areas of science made by relating these outputs to inputs (staff and money). The productivity distribution in terms of publications and citations of the individuals within a laboratory community is also derived.

? King, J. (1988), The use of bibliometric techniques for institutional research evaluation: A study of avian virology research. *Scientometrics*, **14** (3-4), 295-313.

Full Text: [1988\Scientometrics14, 295.pdf](1988/Scientometrics14,%20295.pdf)

Abstract: A bibliometric analysis was made of an area of veterinary research, avian virology, in the context of seeking quantitiative indicators to assist research evaluation for the UK Agricultural and Food Research Council (AFRC). In one approach, a list was made of world publications in avian virology using the CAB database which is the most appropriate literature source in terms of subject specificity and breadth of coverage. Means were sought to minimise the labour input required for citation studies of this kind, results based on peak-year citations only were similar to those from the more widely used four-year count, in terms of country-ranking and time trends. In the second method, the publication outputs of several avian virology research groups were assessed in terms of ‘expected’ citations i.e. the average number of citations per paper received by the journals in which the groups published, as compared to the actual citations received. The rankings of the groups were the same in both methods. This second approach, while giving only approximate citation rates, has the advantage of requiring only in-house data. It seems more appropriate for the ex-post evaluation of the output of research groups in the context of agricultural and food research, and it is suggested that further studies on journal-based indicators are warranted.

Keywords: Science

? Porteous, M. (1988), The role and development of quantitative indicators for research and technology policy making: Some experience from the department of trade and industry. *Scientometrics*, **14** (3-4), 315-327.

Full Text: [1988\Scientometrics14, 315.pdf](1988/Scientometrics14,%20315.pdf)

Abstract: This article discusses quantitative S&T indicators from the perspeetive of their usefulness in bringing longer term considerations into policy making. A number of areas of current and future work by the Longer Term Studies Group of the Department of Trade and Industry are presented as illustrative cases. The main concern of the article, however, is to outline some of the main decisions facing S&T policy making, thereby setting the context for the development and use of quantitative indicators. It is suggested that the approach of considering longer term trends and developments in the context of present-day policy issues may well open new opportunities for the development of quantitative indicators. Above all a pragmatic approach is required, weighing up the value of an indicator with other sources of information in considering their relevance to the practical problems of policy making.

? Pavitt, K. (1988), The size and structure of British technology activities: What we do and do not know. *Scientometrics*, **14** (3-4), 329-346.

Full Text: [1988\Scientometrics14, 329.pdf](1988/Scientometrics14,%20329.pdf)

Abstract: As a result of official, private and university initiatives, indicators of British technological activity have improved considerably over the past 30 years. They reveat strong similarities to other Western, industriahsed countries in the type of activity performed, in its relative concentration within business firms, and in its distribution amongst sectors and firms of different sizes. They also reveal a relatively low level and rate of growth of technological activities, with relative strength in aerospace and chemicals, and decline and weakness in electronics. These patterns result in large part from decisions about technology strategy taken by not much more than a handful of large firms.

? Moravcsik, M.J. (1988), Scientometric indicators: A 32-country comparative-evaluation of publishing performance and citation impact - Braun, T, Glänzel, W, Schubert, A. *Scientometrics*, **14** (3-4), 347-348.

Full Text: [1988\Scientometrics14, 347.pdf](1988/Scientometrics14,%20347.pdf)

? Moravcsik, M.J. (1988), Scientific-research in Israel - Greenwald, N, Herskovic, S. *Scientometrics*, **14** (3-4), 348-349.

Full Text: [1988\Scientometrics14, 348.pdf](1988/Scientometrics14,%20348.pdf)

Keywords: Israel

? Moravcsik, M.J. (1988), Research workers in developing-countries: Origins, formation and research practices - French - Gaillard, J. *Scientometrics*, **14** (3-4), 349-350.

Full Text: [1988\Scientometrics14, 349.pdf](1988/Scientometrics14,%20349.pdf)

? Vanraan, A.F.J. (1988), Comments on small, Henry, recipient of the 1987 Price, Derek, Desolla Award. *Scientometrics*, **14** (5-6), 361-363.

Full Text: [1988\Scientometrics14, 361.pdf](1988/Scientometrics14,%20361.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1988), The newest version of the facts and figures on publication output and relative citation impact in physics, engineering and mathematics 1981-1985. *Scientometrics*, **14** (5-6), 365-382.

Full Text: [1988\Scientometrics14, 365.pdf](1988/Scientometrics14,%20365.pdf)

? Nagpaul, P.S. and Krishnaiah, V.S.R. (1988), Dimensions of research planning: Comparative-study of research units in six countries. *Scientometrics*, **14** (5-6), 383-410.

Full Text: [1988\Scientometrics14, 383.pdf](1988/Scientometrics14,%20383.pdf)

Abstract: This paper seeks to examine the characteristics and quality of research planning at the level of microcosm of the research unit in six countries -Argentina, Egypt, India, Republic of Korea, Poland and USSR. It is concerned basically with the following aspects: (i) differences in the characteristics and quality of research planning in research units in different countries and institutional settings, (II)pattern ofrelationshipsbetween the indices of planning and tbxee measures of effectiveness - scientific, user-oriented and administrative, and (iii) stability in the pattern of relationships across countries and measures of performance. As a result of analysis, a few universal indices have been identified that have consistent relationships across countries. It is concluded that the determinants of effectiveness of research pianning depend upon the criteria used for measuring the performance of the research unit. Besides specificity of research goals, the most important predictors of performance are: conceptual challenge of the research programme and external linkages of the research group- linkages with scientific peers and potential users of research results.

? Hohenester, A., Mathelitsch, L. and Moravcsik, M.J. (1988), The usage of ‘theory’ and ‘model’ in scientific conceptualization. *Scientometrics*, **14** (5-6), 411-420.

Full Text: [1988\Scientometrics14, 411.pdf](1988/Scientometrics14,%20411.pdf)

Abstract: This paper seeks to examine the characteristics and quality of research planning at the level of microcosm of the research unit in six countries -Argentina, Egypt, India, Republic of Korea, Poland and USSR. It is concerned basically with the following aspects: (i) differences in the characteristics and quality of research planning in research units in different countries and institutional settings, (II)pattern ofrelationshipsbetween the indices of planning and tbxee measures of effectiveness - scientific, user-oriented and administrative, and (iii) stability in the pattern of relationships across countries and measures of performance. As a result of analysis, a few universal indices have been identified that have consistent relationships across countries. It is concluded that the determinants of effectiveness of research pianning depend upon the criteria used for measuring the performance of the research unit. Besides specificity of research goals, the most important predictors of performance are: conceptual challenge of the research programme and external linkages of the research group- linkages with scientific peers and potential users of research results.

Ajiferuke, I., Burell, Q. and Tague, J. (1988), Collaborative coefficient: A single measure of the degree of collaboration in research. *Scientometrics*, **14** (5-6), 421-433.

Full Text: [1988\Scientometrics14, 421.pdf](1988/Scientometrics14,%20421.pdf)

Abstract: It is shown that the mean number of authors per paper or the proportion of the multiple-anthured papers is inadequate as a measure of the degree of collaboration in a discipline. A measure which combines some of the merits of both measures is suggested and derived. This measure, called the Collaborative Coefficient, is derived for four commonly used probability distributions.

? Nasierowski, W. (1988), The essence and dilemmas of measurement in the sciences of organization. *Scientometrics*, **14** (5-6), 435-452.

Full Text: [1988\Scientometrics14, 435.pdf](1988/Scientometrics14,%20435.pdf)

Abstract: This paper will discuss the problems of measurement in the theory of organization. The development of methods of measuring is shown to be a condition for progress to this theory. The basic components of measurement are discussed. Main shortcomings involved in the concepts of measurement of features of organization are presented. Their sources and the consequences of their existence for solving organizational problems, are demonstrated. Suggestion for elaborations regarding the elimination of drawbacks will be presented.

? Vinkler, P. (1988), Bibliometric features of some scientific subfields and the scientometric consequences therefrom. *Scientometrics*, **14** (5-6), 453-474.

Full Text: [1988\Scientometrics14, 453.pdf](1988/Scientometrics14,%20453.pdf)

Abstract: In the present work an attempt is made to select journal bases for some subfields in chemistry. Through the modification of the Hirst’s discipline impact factor concept, the primary information base for the selected subfields is determined. Relating impact factors of citing and cited journals, citation strategy indicators are suggefted. Determination of the mean impact factors for subfields enables the introduction of sub fields factors that bring the impact factors of journals of various subfields on a cotrrparable level.

? Nederhof, A.J. (1988), Changes in publication patterns of biotechnologists: An evaluation of the impact of government stimulation programs in six industrial nations. *Scientometrics*, **14** (5-6), 475-485.

Full Text: [1988\Scientometrics14, 475.pdf](1988/Scientometrics14,%20475.pdf)

Abstract: The effects of a government stimulation program on the development of Dutch biotechnology have been studied scientometrically in comparison with world-wide averages, and with the effects of programs of five important large Western industrial nations, in the period 1976-1985. In two priority fields of the Dutch programme, fermentation and bio-industrial chemistry, and biochemical genetics, publication rates were below world average before 1980-1981, but reached levels figrtificanfly above world average in 1984-1985. Both in 1980 and 1984, Dutch articles were characterized by a relatively high abort-term impact. In 1984, the impact of Dutch articles was slightly above the 1980 level. When publications were counted in a core set of 19 bioteehnology relevant journals, the share of Dutch biotechnologist: did not change between 1979-1982 and 1983-1986, while Canada, Japan, France, and, to some extent, the UK, improved their positions, but the Federal Republic of Germany lost some ground.

? Kryzhanovsky, L.N. (1988), An application of bibliometrics to the history of electricity. *Scientometrics*, **14** (5-6), 487-492.

Full Text: [1988\Scientometrics14, 487.pdf](1988/Scientometrics14,%20487.pdf)

Abstract: A bibliometric analysis is performed on the articles$ on or relating to electricity that appeared in the Philosophical Transactions of the Royal Society of London from their commencement, in 1665, to the year 1800. The views of eminent scientists of the 18th century of the scientific ndvance, state of the art and prospects in electricity axe given and commented. Agreemaent between the bibliometric data and scientists’ views is ascertained.

Keywords: Bibliometrics

? Egghe, L. and Rousseau, R. (1988), Reflections on a deflection: A note on different causes of the groos droop. *Scientometrics*, **14** (5-6), 493-511.

Full Text: [1988\Scientometrics14, 493.pdf](1988/Scientometrics14,%20493.pdf)

Abstract: In this paper different aspects that cause the so-called Groos droop, are investigated. We start from pure Bradfordian data (i.e. without a Groos droop) and discuss what actions can cause a deflection on the Bradford-Leimkuhlet curve. It is, of course, well-known, that incompleteness of. the data is one aspect, but we show that taking unions of pure Bradfordian bibliographies can also yield a bibliography with a Groos droop. As such, a Groos droop earl always be expected in interdisciplinary bibliographies.

In this way we suggest an explanation for the experimental differences between the micro- and macro-curves obtained by Bonitz and Schmidt (Scientometrics, 4 (1982) 283.). In conclusion we may say that the Groos droop can be explained thxough Bradford’s law and hence that they do not contradict each other.

? Schubert, A. (1988), Quantitative studies of science: A current bibliography. No. 12. *Scientometrics*, **14** (5-6), 513-520.

Full Text: [1988\Scientometrics14, 513.pdf](1988/Scientometrics14,%20513.pdf)

? Granovsky, Y.V. (1989), Nalimov, V.V. recipient of the 1987 Price, Derek, Desolla Award - Comment. *Scientometrics*, **15** (1-2), 7-12.

Full Text: [1989\Scientometrics15, 7.pdf](1989/Scientometrics15,%207.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1989), The newest version of the facts and figures on publication output and relative citation impact: A collection of relational charts, 1981-1985. *Scientometrics*, **15** (1-2), 13-20.

Full Text: [1989\Scientometrics15, 13.pdf](1989/Scientometrics15,%2013.pdf)

? Dobrov, G. and Skofenko, A. (1989), Fuzzy expertise and its application to research and development management. *Scientometrics*, **15** (1-2), 21-31.

Full Text: [1989\Scientometrics15, 21.pdf](1989/Scientometrics15,%2021.pdf)

Abstract: Applications of fuzzy set theory to various problems of data processing influenced greatly the analysis of expert opinion results. The authors developed models based on the fuzzy set concept for expert assessments using quantitative and qualitative scales typical in R & D management. The approach is illustrated by the solution of the problem of ranking of the factors influencing practical applications of research results.

? Granovsky, Yu.V. (1989), Scientometrics theory of experiment and optimization of research. *Scientometrics*, **15** (1-2), 33-43.

Full Text: [1989\Scientometrics15, 33.pdf](1989/Scientometrics15,%2033.pdf)

Abstract: An approach to optimization of research based on the theory of experiment and scientometrics is proposed. Research is treated as an experiment aimed at attainment of optimal conditions. The following successive phases of optimization have been singled out: selection of optimisation parameters and factors, carrying out the experiment, and processing and interpreting the results obtained. Methods of multidimensional classification and screening are recommended for selection of optimization parameters and factors. Evolutionary operation representations are used at the optimization stage. Problems of optimization research should be tackled in centres of scientific information where data on advances made in various scientific fields are accumulated.

Keywords: Scientometrics

? Haitun, S.D. (1989), Science studies and natural-sciences: Which is primary, distribution or interdependence between variables. *Scientometrics*, **15** (1-2), 45-58.

Full Text: [1989\Scientometrics15, 45.pdf](1989/Scientometrics15,%2045.pdf)

Abstract: It is shown that in natural sciences, interdependences between variables are determined regardless of the distributions of variable values, whereas in science studies, distributions should be used as a starting point. This difference is due the nature of measuring instruments: in natural sciences, measurements are performed with the use of devices, while science of science uses “human devices” adapting themselves to the measured objects. Practical inferences are drawn.

? Korennoi, A.A. (1989), Information co-modeling of a network of research institutions. *Scientometrics*, **15** (1-2), 59-71.

Full Text: [1989\Scientometrics15, 59.pdf](1989/Scientometrics15,%2059.pdf)

Abstract: A method of measuring the communication in a network of research institutions is presented. The method is based on the determination of the subject similarity of research reports. The requests of the users are taken into account. The hierarchic cluster analysis of communication in the network is fulfilled on the base of the fuzzy binary relations of similarity between objects.

? Malciene, L. (1989), Scientometric analysis of a scientific school. *Scientometrics*, **15** (1-2), 73-85.

Full Text: [1989\Scientometrics15, 73.pdf](1989/Scientometrics15,%2073.pdf)

Abstract: A procedure including scientometric methods combined with other techniques is described. This allows to define the membership and structure of a scientific school and to trace the dynamics of its development. Formation and evolution of a scientific school is presented as a purposeful scientific-information process involving changes in the nature and dynamics of the types of information links.

? Mokhov, O.I. (1989), About statistics of the extreme values and the rank form of scientometric distributions. *Scientometrics*, **15** (1-2), 87-96.

Full Text: [1989\Scientometrics15, 87.pdf](1989/Scientometrics15,%2087.pdf)

Abstract: The relation between the frequency and rank forms and the connection of the parameters of the corresponding model scientometric distributions is discussed. Besides, while using the probabilistic interpretation of the data which are presented as a sample, from a model population, the behaviour of the extreme values is examined. For example, the median .mu. of the distribution of the maximal values for the samples of the size N from the Zipf-Pareto distribution, which is typical for social phenomena, increases fate than the sample size N if a < 1: .apprx. const. Nl/.alpha.. the knowledge of the asymptotical behaviour of the characteristics of the extreme values is necessary for the adequate modelling in scientometrics.

? Motylev, V.M. (1989), The main problems of studying literature aging. *Scientometrics*, **15** (1-2), 97-109.

Full Text: [1989\Scientometrics15, 97.pdf](1989/Scientometrics15,%2097.pdf)

Abstract: Aging is otte of the properties of scientific and technical literature. The knowledge of the laws of aging is very important in the science of science, information science and library science. Methodological errors in studying the aging process cause wrong results. By means of non-traditional processing of well-known empiric data the author refutes such genr accepted ideas as the idea of very rapid aging of literature, the idea of more rapid aging of publications on rapidly developing fields of knowledge, the idea of the maximum of book use being only in a few years after its publication, and some other ideas.

? Orlov, S.V. and Vasiljev, A.N. (1989), Possible treatment of the Bonitz-Gross effect. *Scientometrics*, **15** (1-2), 111-126.

Full Text: [1989\Scientometrics15, 111.pdf](1989/Scientometrics15,%20111.pdf)

Abstract: We suggest some theoretical considerations concerning patastatistieal distribution of rife number of journals by the number of attieles which they contain (structural units). Our experiments agree with the theoretical conclusions with accuracy up to 0.31%, and with Price’s experiments - with accuracy of 0.7%.

The qualitive agreement of the theoretical model suggested is shown with Bonitz’s experiments. The agreement of the theory and the experiment is discussed and it is shown that the model suggested describes the Groos effect, i. e. it introduces a correction to the Bradford law.

Keywords: Treatment

? Sharabchiev, J.T. (1989), Cluster-analysis of bibliographic references as a scientometric method. *Scientometrics*, **15** (1-2), 127-137.

Full Text: [1989\Scientometrics15, 127.pdf](1989/Scientometrics15,%20127.pdf)

Abstract: Possible applications of cluster analysis of bibliographic references as a scientometric method are studied. It is shown that cluster analysis, made by means of bibliographic coupling by Kessler and co-citation by Marshakova-Small present comparable results. “Science maps” on immunological topics are made. Particularly for historico-scientific studies it is useful to make clusters in rectangular coordinates taking into account the value of citing the document and the year of its publication. It is observed that at the junction points of sciences there is an almost twofold deceleration of the processes of application and spreading of knowledge. It is stated that the problem of “information explosion” does not exist on the level of new ideas, the number of which is less than 0.1% of the total volume of the published information flow 40% of which is formed by “information noise”.

? Doroshenko, S.I. and Haitun, S.D. (1989), Quantitative studies of science: A bibliography of soviet publications. *Scientometrics*, **15** (1-2), 139-154.

Full Text: [1989\Scientometrics15, 139.pdf](1989/Scientometrics15,%20139.pdf)

? Kostyuk, V. and Schreider, J. (1989), Mathematical models in science studies - Yablonsky, AI. *Scientometrics*, **15** (1-2), 155-157.

Full Text: [1989\Scientometrics15, 155.pdf](1989/Scientometrics15,%20155.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1989), Assessing assessments of British science some fact and figures to accept or decline. *Scientometrics*, **15** (3-4), 165-170.

Full Text: [1989\Scientometrics15, 165.pdf](1989/Scientometrics15,%20165.pdf)

Notes: MModel, CCountry

? Gupta, D.K. (1989), Scientometric study of biochemical literature of Nigeria, 1970-1984 - application of Lotka’s law and the 80/20-rule. *Scientometrics*, **15** (3-4), 171-179.

Full Text: [1989\Scientometrics15, 171.pdf](1989/Scientometrics15,%20171.pdf)

Abstract: A bibliography of biochemical literature of Nigeria for the period, 1970-1984 containing a total of 500 items, was analysed to test the applicability of Lotka’s law and 80/20-rule to the author productivity distribution patterns. Four different f’des were created out of the data on author productivity: one for the publication of all the authors, second for the publications by ttrst authors only, third for single authors and fourth for the contributions of only coauthors. Lotka’s law could apply in all the four cases with different values of ~. The Kolmogorov- Smirnov testi~ was applied to test the applicability of Lotka’s law at 0.01 level of significance. Egghe’s theory and formula were used to test 80/20-rule and it was found that the rule did not apply to any of the four data sets.

Keywords: Nigeria

? Purica, I.I. (1989), Creativity and the socio-cultural niche. *Scientometrics*, **15** (3-4), 181-187.

Full Text: [1989\Scientometrics15, 181.pdf](1989/Scientometrics15,%20181.pdf)

Abstract: The socio-cultural dimensions of the creative act is analysed by a mathematical model considering that the creative act is a mimes mutation as a result of an accumulation of evidences. So the mimes complex of a socio-cultural niche is changed explosively if given conditions, which are mathematically determined, are accomplished. The equation determining the sociocultural dimensions of creativity is established and its solutions are discussed.

? Lindsey, D. (1989), Using citation counts as a measure of quality in science - measuring whats measurable rather than whats valid. *Scientometrics*, **15** (3-4), 189-203.

Full Text: [1989\Scientometrics15, 189.pdf](1989/Scientometrics15,%20189.pdf)

Abstract: Empirical work in the social studies of science has progressed rapidly with the availability and development of the citation indexes. Citation counts have become a widely accepted measure of the quality of a scientific contribution. However, there are several problems involved in the use of citation counts as a measure of quality in science. First, citation counts are sensitive to popular trends in science. In this sense, they approximate a Nielsen rating for science. Second, the distribution of citations restricts their utility to separating the extremes. Third, citation counts are not sensitive to the ethical and moral dimensions of the quality of a scientific contribution. Fourth, citation counts underestimate the contribution of applied scientists. This paper examines these limitations.

Notes: MModel

Kyvik, S. (1989), Productivity differences, fields of learning, and Lotka’s law. *Scientometrics*, **15** (3-4), 205-214.

Full Text: [1989\Scientometrics15, 205.pdf](1989/Scientometrics15,%20205.pdf)

Abstract: The paper examines whether productivity differences among individual researchers are larger in some fields of learning than in others. Productivity patterns in the natural sciences, the medical sciences, the social sciences, and the humanities are compared by the use of unweighted and weighted publication counts. Irrespective of whether total number of publications or a refined indicator taking account of type of publication and multiple authorship are used, there are no essential differences in publishing inequality between the various fields. About 20% of the tenured faculty at Norwegian universities produce 50% of the total output, and the most prolific half of the researchers account for almost 85% of the Output. The results are discussed in relation to Lotka’s law.

? Davis, C.H. and Eisemon, T.O. (1989), Mainstream and non mainstream scientific literature in four peripheral Asian scientific communities. *Scientometrics*, **15** (3-4), 215-239.

Full Text: [1989\Scientometrics15, 215.pdf](1989/Scientometrics15,%20215.pdf)

Abstract: This paper describes the mainstream scientific output of the scientific communities of four newly industrializing Asian countries (Malaysia, Singapore, South Korea, and Taiwan) and considers its adequacy for describing local scientific activities in biochemistry, biology, physics, electrical engineering, and computer science. An examination of non mainstream scientific literature in these specialties shows that a high proportion of non mainstream authors also publish in mainstream literature. Data concerning degree of parochialism, age of references and use of vernacular literature are examined. The paper argues that it is misleading to characterize these peripheral scientific communities as principally stratified in function of local scientists’ participation in mainstream science.

? Kidd, J.S. (1989), The popularization of science II. Patterns of topical coverage. *Scientometrics*, **15** (3-4), 241-255.

Full Text: [1989\Scientometrics15, 241.pdf](1989/Scientometrics15,%20241.pdf)

Abstract: Topical coverage by major scientific discipline on the part of six popular monthly magazines is compared to expected values based on the number of doctoral graduates per discipline. A major discrepancy is found in the relatively sparse coverage of chemistry. A case study of advances in catalysis is used to demonstrate that there are newsworthy developments in chemistry that could provide copious source materials. Speculative explanations for the relatively scant attention given to chemistry are advanced. The neglect of chemistry by the popular media is seen as a possible problem area for science educators who may depend on supplementary readings at all levels of instruction including informal adult education.

? Rice, R.E., Borgman, C.L., Bednarski, D. and Hart, P.J. (1989), Journal to journal citation data issues of validity and reliability. *Scientometrics*, **15** (3-4), 257-282.

Full Text: [1989\Scientometrics15, 257.pdf](1989/Scientometrics15,%20257.pdf)

Abstract: Citation analysis is a useful method for studying a wide range of topics in bibliometrics and the sociology of science. However, many challenges have been made to the validity and reliability of the underlying assumptions, the data, and the methods used in citation studies. This article addresses these issues in three parts. First is a brief review of validity and reliability issues in citation research. Next we explore measurement error in a principal source of journal-to-journal citation data, the Institute for Scientific Information’s Journal Citation Reports. Possible sources of measurement error include discrepancies between citing and cited data, changed or deleted journal titles, aberrant abbreviations, and listing algorithms. The last section is a detailed description of ways to overcome some of the measurement errors. The data and examples are drawn from a journal-to-journal citation study in the fields of Communication, Information Science, and Library Science.

? Tijssen, R.J.W. and Vanraan, A.F.J. (1989), Mapping co-word structures: A comparison of multidimensional-scaling and Leximappe. *Scientometrics*, **15** (3-4), 283-295.

Full Text: [1989\Scientometrics15, 283.pdf](1989/Scientometrics15,%20283.pdf)

Abstract: The LEXIMAPPE method and Multidimensional Scaling (MDS) are discussed as methods to visualize (‘map’) characteristics of structures of word-occurrence (‘co-word’) relations. Utilization of MDS is proposed as an alternative mapping method able to circumvent problematic features of LEXIMAPPE maps of the total co-word structure. A comparison of both methods on the same ‘real-life’ co-word matrix demonstrates topological advantages of an extended MDS-mapping.

? Yamazaki, S. (1989), Referee systems of English-language scientific journals in Japan. *Scientometrics*, **15** (3-4), 297-303.

Full Text: [1989\Scientometrics15, 297.pdf](1989/Scientometrics15,%20297.pdf)

Abstract: The purpose of this survey is to review the present situation of the referee systems of 55 English-language scientific journals in Japan, and to evaluate their quality and international readership of those journals. Based on this survey, the author discusses some editorial efforts Which may promote the greater use worldwide.

Keywords: Japan

? Rousseau, R. (1989), Merging data sets. *Scientometrics*, **15** (3-4), 305-308.

Full Text: [1989\Scientometrics15, 305.pdf](1989/Scientometrics15,%20305.pdf)

Abstract: We give an upper and a lower bound for the. slope, on a semi logarithmic scale, of the cumulative graph of a data set, such as a bibfiography, originating from the disjoint merging of two similar data sets.

? Han, H.C. (1989), Linear increase law of optimum age of scientific creativity. *Scientometrics*, **15** (3-4), 309-312.

Full Text: [1989\Scientometrics15, 309.pdf](1989/Scientometrics15,%20309.pdf)

Abstract: A linear increase law of optimum age of scientific creativity is proposed. The author has analysed the optimum age of major scientific discoveries (or inventions) by the least square method and an increase ratio has been obtained. The optimum age and the age of great fame in next half century are foreast also.

? Yaalon, D.H. (1989), Scientific strategies and development: Soil science of the tropics - French - Chatelin, Y, Arvanitis, R. *Scientometrics*, **15** (3-4), 313-314.

Full Text: [1989\Scientometrics15, 313.pdf](1989/Scientometrics15,%20313.pdf)

? Tague, J. (1989), Scientific Journals - Issues for library selection and management - Stankus, T. *Scientometrics*, **15** (3-4), 314-315.

Full Text: [1989\Scientometrics15, 313.pdf](1989/Scientometrics15,%20313.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1989), World flash on basic research: Some data on the distribution of journal publication types in the Science Citation Index database. *Scientometrics*, **15** (5-6), 325-330.

Full Text: [1989\Scientometrics15, 325.pdf](1989/Scientometrics15,%20325.pdf)

Keywords: Science Citation Index

? Leydesdorff, L. (1989), The relations between qualitative theory and scientometric methods in science and technology studies: Introduction to the topical issue. *Scientometrics*, **15** (5-6), 333-347.

Full Text: [1989\Scientometrics15, 333.pdf](1989/Scientometrics15,%20333.pdf)

Abstract: This issue of *Scientometrics* originated from a Workshop of the European Association for the Study of Science and Technology (EASST). In this introduction the relations between qualitative theory and the use of scientometric methods is placed in the historical perspective of the emergence of science and technology studies over the last decades. The differences among various theories in terms of dimensions, units of analysis and levels of aggregation are elaborated. Thereafter, the various contributions to the issue are discussed within this framework.

? Luukkonen, T. (1989), Publish in a visible journal or perish: Assessing citation performance of Nordic cancer-research. *Scientometrics*, **15** (5-6), 349-367.

Full Text: [1989\Scientometrics15, 349.pdf](1989/Scientometrics15,%20349.pdf)

Abstract: This paper deals with three types of questions concerning the application of citation analysis. First, it studies the use of citation analysis for assessing national research performance in a research subfield, second, it discusses methodological problems related to the definition of research subfields and to data acquisition, and third, as the data concern four Nordic countries, Denmark, Finland, Norway, and Sweden, attention will be devoted to special problems arising from the application of citation analysis to relatively small countries. These problems are of both methodological and interpretative character.

? Irvine, J. and Martin, B.R. (1989), International comparisons of scientific performance revisited. *Scientometrics*, **15** (5-6), 369-392.

Full Text: [1989\Scientometrics15, 369.pdf](1989/Scientometrics15,%20369.pdf)

Abstract: This paper presents a methodological analysis of the latest update of the CHI/NSF Science Literature Indicators Data-Base. The data-base contains a range of publication and citation indicators broken down by country and field or subfield, and now covers the period from 1973 to 1984. It can be used to draw comparisons of the changing output and impact of basic research in different countries. Earlier applications of the data-base have been constrained by various technical limitations, and have been subject to certain criticism. In this article, after some conceptual analysis of what aspects of scientific performance the different indicators relate to, we show that much of the criticism is misplaced. We also describe subsequent methodological improvements to the indicators and the effect these have on the policy use that can be made. Finally, we examine what the latest statistics reveal about the relative international standing of seven leading scientific nations.

Arunachalam, S. and Manorama, K. (1989), Are citation-based quantitative techniques adequate for measuring science on the periphery? *Scientometrics*, **15** (5-6), 393-408.

Full Text: [1989\Scientometrics15, 393.pdf](1989/Scientometrics15,%20393.pdf)

Abstract: The inadequacies of citation analysis-based quatitative techniques in the context of developing countries owe their origins to the rather small size of most peripheral country scientific enterprises, the poor coverage of Third World journals in bibliographic databases, (and in particular SCI), the cognitive limitations of citation analysis pointed out by microsociologists, and the non-normative nature of the scientific enterprise in these countries. Much of peripheral science is derivative and imitative of science done in the centre, rather than ‘original’ or ‘path-breaking’, and there is hardly any indigenous ‘scientific community’. And yet, citation analysis-based quantitative measures can be applied to characterise different aspects of peripheral science. These techniques assume great importance, especially in view of the massive inadequacies of the peer review process prevailing in these countries. The application of such citation-based quantification to units Of different levels of aggregation such as a journal, an institution and a country as a whole has been demonstrated taking India as the example. Our results show that levels of funding have no correlation with the quality or international citation impact of the literature output resulting from a project. Almost all Indian journals have a very low impact on world literature, and the relatively better performance of Journal of Astrophysics and Astronomy (and Indian astronomical research in general) owes it to favourable factors, both social and cognitive.

? Groenewegen, P. (1989), Influences of local and organizational-factors on output indicators. *Scientometrics*, **15** (5-6), 409-422.

Full Text: [1989\Scientometrics15, 409.pdf](1989/Scientometrics15,%20409.pdf)

Abstract: Publication and citation indicators of groups are thought to enhance the quality and legitimacy of science policy decisions. While these indicators might be of value from a policy point of view, the relation between these cumulative data and the local circumstances that influence the development of scientific knowledge has not been explored extensively. In this paper it is argued that publication and citation patterns related to research units are influenced by local circumstances. Toxicology is chosen as an example because it is directed at solving social problems and relates to local practices. In this paper, output indicatiors of Dutch toxicological research units are related to qualitative information on the strategies of these units, it can be shown that the variation in output and citation indicators can be explained in terms of local variations in context. Such variations in local organizational settings should caution against the application of scientometric studies to measure impact as an indicator of scientific quality.

? Nederhof, A.J., Zwaan, R.A., Debruin, R.E. and Dekker, P.J. (1989), Assessing the usefulness of bibliometric indicators for the humanities and the social and behavioral-sciences: A comparative-study. *Scientometrics*, **15** (5-6), 423-435.

Full Text: [1989\Scientometrics15, 423.pdf](1989/Scientometrics15,%20423.pdf)

Abstract: An evaluation was made of the use of bibliometric indicators for five disciplines in the humanities (social history, general linguistics, general literature, Dutch literature, and Dutch language) and three disciplines in the social and behavioural sciences (experimental psychology, anthropology, and public administration) in the Netherlands. Articles in journals were the predominant outlet in all disciplines. Monographs and popularizing articles were more important outlets in ‘softer’ fields than in ‘harder’ ones. The enlightenment function of scholarship was especially evident in Dutch literature and language, and public administration. Only some of the humanities disciplines are locally oriented. Although many publications were written in English, only experimental psychology, general linguistics, anthropology, and general literature were internationally oriented regarding output media. The impact of departments differed greatly both within and between disciplines. For all disciplines, bibliometric indicators are potentially useful for monitoring international impact, as expert interviews confirmed. Especially in Dutch language, Dutch literature and public administration, ISI-citation data are not very useful for monitoring national impact.

? Cozzens, S.E. (1989), What do citations count? The Rhetoric first model. *Scientometrics*, **15** (5-6), 437-447.

Full Text: [1989\Scientometrics15, 437.pdf](1989/Scientometrics15,%20437.pdf)

Abstract: Because of the widespread use of citations in evaluation, we tend to think of them primarily as a form of colleague recognition. This interpretation neglects rhetorical factors that shape patterns of citations. After reviewing sociological theories of citation, this paper argues that we should think of citations first as rhetoric and second as reward. Some implications of this view for quantitative modeling of the citation process are drawn.

Amsterdamska, O. and Leydesdorff, L. (1989), Citations: Indicators of significance? *Scientometrics*, **15** (5-6), 449-471.

Full Text: [1989\Scientometrics15, 449.pdf](1989/Scientometrics15,%20449.pdf)

Abstract: What makes a scientific article significant? This paper - part of a larger study which will examine how various kinds of significance carl be related to one another in a coherent theoretical framework - focusses on the processes by which new knowledge claims are being integrated into the cognitive structure when they are cited in other papers, Citations appear both as “threads” linking the eiting papers to the existing literature in the field, and as elements fulfilling specific functions within the arguments made in-,these papers. We have found that (1) it is misleading to equate every article with a single knowledge claim, let alone with an attempt to construct “a fact”, (2) even when the same “sentence” is cited repeatedly, it can be put to quite different uses in the citing papers, and (3) the process of codification of scientific knowledge, through the use of references appears to be far more complex and multi-dimensional than citation context analyses focussing on the use and the gradual disappearance of modalities would lead us to believe. Some consequences for the use use of citation analysis to reconstruct cognitive structures will be discussed.

? Moed, H.F. (1989), Bibliometric measurement of research performance and Price’s theory of differences among the sciences. *Scientometrics*, **15** (5-6), 473-483.

Full Text: [1989\Scientometrics15, 473.pdf](1989/Scientometrics15,%20473.pdf)

Abstract: A severe criticism against the use of citation indicators for the measurement of a research group’s performance holds that these indicators reflect at least partly the size of the scientific activity in the subfield or topic in which the group works. In this contribution an attempt is made to substantiate this claim within the framework of Price’s theory on the processes of knowledge growth. Empirical evidence is presented that among a number of subfields from the natural and life sciences significant differences exist with respect to Price’s index, and that the citation scores of research groups tend to be high in subfields showing a high value of Price’s index and other characteristics of reference patterns. These findings suggest that groups sharing an intellectual focus with other researchers tend to obtain higher citation scores than groups working more ‘on their own’.

? Hagendijk, R.P. and Smeenk, J.W. (1989), The analysis of national subfields: A case-study of Dutch fresh-water ecology. *Scientometrics*, **15** (5-6), 485-508.

Full Text: [1989\Scientometrics15, 485.pdf](1989/Scientometrics15,%20485.pdf)

Abstract: Bibliometric analysis is combined with a psychometric analysis of the perceptions which researchers in a community of Dutch fresh-water ecologists have of their professional environment. The results of these two types of analysis converge and can be understood by an exploration of the institutional and intellectual development of the community and the intellectual continuities in the careers of the researchers involved. International developments appear to be taken up in ways which reflect the particular socio-cognitive organization of the national subfield. The article claims that such national subfields of science constitute a strategic research site for social studies of science which is also dixeetly relevant for science policy analysis. It pleads for the employment of a combination of methods in the synchronic and diachronic analysis of the structures of such subfields.

? Vanrossum, W. (1989), Operationalizing developments in a problem field: The case of Mbd. *Scientometrics*, **15** (5-6), 509-526.

Full Text: [1989\Scientometrics15, 509.pdf](1989/Scientometrics15,%20509.pdf)

Abstract: For the most part scientific developments in problem fields result in increasing specification of research problems. With respect to the problem of Minima/ Brain Dysfunction, however, the reverse trend can be observed. In the case of the occurrence of behavioural problems related to minimal brain dysfunction, scientific developments resulted in a more diffuse formulation because of the nature of this problem. In the paper co-word analysis methodology is used to study changes in the structure of networks around central terms in this field for the period 1970-1984. It is apparent that central terms in the field arc not able to “funnel the interests” in the field despite the growing number of scientific articles written on the subject.

? Courtial, J.P. (1989), Qualitative models, quantitative tools and network analysis. *Scientometrics*, **15** (5-6), 527-534.

Full Text: [1989\Scientometrics15, 527.pdf](1989/Scientometrics15,%20527.pdf)

Abstract: One model for knowledge development is the network interaction model. Insofar as socio-technical networks may have some structural properties, does knowledge development reflect this? The hypothesis that it does may enable us to make some forecasts of science development from a description of the state of a field. One condition necessary for testing this hypothesis is that of adopting a model for these networks. Co-word analysis is such a tool. It gives us key-words networks derived from scientific and technical texts. The author checks for network properties in the area of knowledge development through a case study of Polymer Science and Technology from 1973 to 1978.

? Bastide, F., Courtial, J.P. and Callon, M. (1989), The use of review articles in the analysis of a research area. *Scientometrics*, **15** (5-6), 535-562.

Full Text: [1989\Scientometrics15, 535.pdf](1989/Scientometrics15,%20535.pdf)

Abstract: Review articles in the field of polymer science in the seventies are analyzed in order to check their usefulness in describing at a very low cost the development or the state of the art of a field. Results are compared with those obtained through a quantitative study of scientific articles published at the same time in the field. Review articles can be regarded as defining a research programme attempting to link together two networks: polymer properties - as being desirable from market Considerations - and polymer structure - as being analyzable by means of academic science, through three kinds of “translation” strategies. If we thus define a research programme in terms of the mobilization of networks, it is possible to say of review articles that they provide a good representation of the development of networks of problems whose evolution they sketch.

? Kranakis, E. and Leydesdorff, L. (1989), Teletraffic conferences: Studying a field of engineering science. *Scientometrics*, **15** (5-6), 563-591.

Full Text: [1989\Scientometrics15, 563.pdf](1989/Scientometrics15,%20563.pdf)

Abstract: Titles of 925 conference papers contained in the first l~en International Teletraffie Conferences (1955-1983) are analyzed in terms of word distributions. The aim is to determine how information about changing word frequencies and word patterns relates to the kind of information gained through the more traditional approach of intellectual history. Additionally, we consider what each approach can reveal about the information flows involved in the production and utilization of knowledge in teletraffic. In terms of methodology, the goal of this dual approach is to understand how the analysis of word and document structures can be used both as a seientometrie tool and as a tool for historical research. We also comment more generally on the significance of conferences as an object for scientometric analysis, particularly with respect to the emergence and growth of the engineering and industrial sciences.

? Todorov, R. (1989), Representing A scientific field: A bibliometric approach. *Scientometrics*, **15** (5-6), 593-605.

Full Text: [1989\Scientometrics15, 593.pdf](1989/Scientometrics15,%20593.pdf)

Abstract: A new bibliometrie method is proposed for representing links between subfields as defined by a classification scheme. The frequency of co-occurrence of articles from different subfields in selected journals is used for measuring the degree of relatedness between these subfields. The results of such quantitative analysis could be compared to the thee topology of the classification network established in a qualitative analysis. The method is applied to describe the internal links within the field of condensed matter physics using the 1984 Physics Abstracts database. A distinction is made between experimental and theoretical links on the basis of treatment codes assigned to journal articles. The links deseribed by cluster analysis axe matched against the cross-reference network of the International Classification for Physics.

? Vanraan, A.F.J. and Peters, H.P.F. (1989), Dynamics of a scientific field analyzed by co-subfield structures. *Scientometrics*, **15** (5-6), 607-620.

Full Text: [1989\Scientometrics15, 607.pdf](1989/Scientometrics15,%20607.pdf)

Abstract: This paper discusses the possibility to represent scientific development by ‘second-order networks’ in different modalities. In particular, a specific modality structured by subfield-to-subfield relations is presented. By constructing such ‘co-subfield maps’ for successive periods of time, we were able to describe the changing subfield relations within the field of chemical engineering. In this way, dynamical processes in the development of a field as a whole can be revealed. Advantages and disavantages as compared to co-eitatio n and co-word mapping techniques are discussed and the importance of developing combined techniques is stressed.

? Mendez, A. and Gomez, I. (1989), A comparison of citation classics in 3 fields of science. *Scientometrics*, **15** (5-6), 621-631.

Full Text: [1989\Scientometrics15, 621.pdf](1989/Scientometrics15,%20621.pdf)

Abstract: A sample of “Citation Classics” in three scientific fields was studied to uncover citing motivations. The classics were classified into basic research, methods and reviews. Number of citations received per classic, number of authors, and age of classic per category and scientific field were the parameters studied. Journals and countries accounting for the highest incidence of classics were examined. A striking parallelism was found in the parameters applied to the categories in the scientific fields Studied. This parallelism suggests similar citing habits of scientists in the fields studied which should be reflected in the structures of Science obtained through citation grounded bibliometric models.

Notes: highly cited

? Schubert, A., Glänzel, W. and Braun, T. (1989), Scientometric datafiles: A comprehensive set of indicators on 2649 journals and 96 countries in all major science fields and subfields 1981-1985. *Scientometrics*, **16** (1-6), 3-478.

Full Text: [1989\Scientometrics16, 3.pdf](1989/Scientometrics16,%203.pdf)

? Vanraan, A.F.J. (1989), Narin, francis recipient of the 1988 Price, Derek, Desolla Award - Comments. *Scientometrics*, **17** (1-2), 5-7.

Full Text: [1989\Scientometrics17, 5.pdf](1989/Scientometrics17,%205.pdf)

? Korennoi, A. (1989), Dobrov, Gennady, M., 1929-1989 - Obituary. *Scientometrics*, **17** (1-2), 9-10.

Full Text: [1989\Scientometrics17, 9.pdf](1989/Scientometrics17,%209.pdf)

? Braun, T., Glänzel, W. and Schubert, A. (1989), National publication patterns and citation impact in the multidisciplinary journals nature and science. *Scientometrics*, **17** (1-2), 11-14.

Full Text: [1989\Scientometrics17, 11.pdf](1989/Scientometrics17,%2011.pdf)

? Hall, D.H. (1989), Rate of growth of literature in geoscience from computerized databases. *Scientometrics*, **17** (1-2), 15-38.

Full Text: [1989\Scientometrics17, 15.pdf](1989/Scientometrics17,%2015.pdf)

Abstract: dely available to researchers that they have become potentially an important source of time series estimates of the growth of scientific literature. This paper uses the GEOREF s database in such an application to estimation of the growth of geoscience. It is found by comparison with studies previously done from the hardcopy equivalents of GEOREF s that the computer-derived time series can achieve results similar to their equivalents and do this more efficiently, more inexpensively and more comprehensively. Examples are given for geoscience as a whole, and for the literature related to several mineral commodities: iron ore, lead ore, nickel ore, petroleum and natural gas, radioactive minerals and ores, and zinc ore.

? Cronin, B. and Dearenas, J.L. (1989), The Geographic-Distribution of Mexican health-sciences research. *Scientometrics*, **17** (1-2), 39-48.

Full Text: [1989\Scientometrics17, 39.pdf](1989/Scientometrics17,%2039.pdf)

Abstract: The distribution of Mexican health science publications according to the states of origin, institutions, main cities has been measured in four main health science bibliographic databases. The results showed that Mexican health sciences research activities are highly skewed.

? Self, P.C., Filardo, T.W. and Lancaster, F.W. (1989), Acquired immunodeficiency syndrome AIDS and the epidemic growth of its literature. *Scientometrics*, **17** (1-2), 49-60.

Full Text: [1989\Scientometrics17, 49.pdf](1989/Scientometrics17,%2049.pdf)

Abstract: The beginning and early spread of the world-wide epidemic of acquired immunodeficiency syndrome (AIDS) has been paralleled closely by a rapidly expanding literature concerned with many aspects of the disease. In order to assess the growth of the AIDS literature, a quantitative analysis was conducted focusing on the number of articles, the number of journals contributing, the number of languages used, and the number of countries of origin of publications over time (a bibliometric study). The growth of the popular literature was also studied. Three online databases - MEDLINE, Magazine Index, and the National Newspaper Index - were examined from 24 September 1982 (the datea the Centers for Disease Control first adopted the name ‘acquired immunodeficiency syndrome’) through the end of 1986 for the popular literature and through the end of 1987 for MEDLINE. A survey of the MEDLINE file showed that by the end of 1987, twenty-five languages were represented in articles from fifty-four countries published in 1170 different journal titles.

? Dou, H., Hassanaly, P. and Quoniam, L. (1989), Infographic analytical tools for decision makers - analysis of the research production in sciences - Application to chemistry, comparison between marseille and montpellier (France). *Scientometrics*, **17** (1-2), 61-70.

Full Text: [1989\Scientometrics17, 61.pdf](1989/Scientometrics17,%2061.pdf)

Abstract: Most of the scientific and technical databases contain codes. These codes divide the area of the database field in subfields. These divisions can be used to map automatically the research network of a subject, and to provide its main research poles. The present paper explains the methodology, and applies it to *Chemical Abstracts,* and to the analysis of the research production of various academic institutions. The method is general and can be used with other databases such as Inspec, WPI-WPIL, etc...

Keywords: France

? Plomp, R. (1989), Statistical reliability of citation frequency as an indicator of scientific impact. *Scientometrics*, **17** (1-2), 71-81.

Full Text: [1989\Scientometrics17, 71.pdf](1989/Scientometrics17,%2071.pdf)

Abstract: The article deals with the statistical problem of the difference between the mean citation frequencies of two sets of papers required to be significantly different. An analysis of citation data indicated that, as a first-order approximation, (1) The relative spread due to a short observation interval is independent of the long-term citation frequency and (2) the relative spread in long-term citation frequencies of different papers from the same author is independent of the mean citation score for the papers by that author. As a rule-of-thumb, these two sources of variance can be characterized by standard deviations of a ratio (factor) of 2 and 3, respectively. By applying these results to citation data published in the literature, it is shown that sometimes statistically unjustified conclusions have been drawn in the past.

? Moral, L.P. (1989), Elements for a diagnosis of applied-research and development in Cuba using patent information - 1968-1983. *Scientometrics*, **17** (1-2), 83-96.

Full Text: [1989\Scientometrics17, 83.pdf](1989/Scientometrics17,%2083.pdf)

Abstract: This paper presents some results of the first studies done in the country using information from patents applied for in Cuba by national and foreign entities. Its main objective is to demonstrate the potential usefulness of this source of data, and of the types of analysis used for the elaboration of diagnoses, as well as for the description of some tendencies of national innovation and R+D efforts. The most relevant technological fields, the participation of the countries during the period and the intensity of their activity in those fields were the aspects studied.

? Oluicvukovic, V. (1989), Impact of productivity increase on the distribution pattern of journals. *Scientometrics*, **17** (1-2), 97-109.

Full Text: [1989\Scientometrics17, 97.pdf](1989/Scientometrics17,%2097.pdf)

Abstract: In this study an attempt to examine the dependence between the productivity of core journals and the shape of the distribution curve in the upper section is made. For this purpose, the impact of the core journal productivity increase over an extended time interval was investigated. As a referent point in relation to which the changes were followed, equalized inverse relationship between the core and periphery in terms of the number of journals and the number of papers published in them in a given subject field has been hypothesized. The degree to which a particular set of data conforms to that relationship expressed as #, is taken as an indicator of the changes in the core/periphery relation. The applicability of Lotka’s exponent in the journal productivity context is also discussed.

? Leydesdorff, L. (1989), The Science Citation Index and the measurement of national performance in terms of numbers of scientific publications. *Scientometrics*, **17** (1-2), 111-120.

Full Text: [1989\Scientometrics17, 111.pdf](1989/Scientometrics17,%20111.pdf)

Abstract: A debate has occurred recently over the issue whether it is possible to account for differences in results when using various versions of the *Science Citation Index* for the measurement of national performance in terms of numbers of scientific publications. This article provides an overview of the various arguments which have been made, and reports that recent reorganization in the on-line installations *[SciSearch]* should make it possible to circumvene one of the major sources of error.

Keywords: Science Citation Index

? Gillett, R. (1989), Determining the best departments by their best publications - A strategy best avoided. *Scientometrics*, **17** (1-2), 121-125.

Full Text: [1989\Scientometrics17, 121.pdf](1989/Scientometrics17,%20121.pdf)

Abstract: The technique of sampling a department’s k best publications as a means of assessing the quality of its research performance is investigated. It is shown that this procedure confounds merit with departmental size, and leads to a substantial overestimation of the research achievement of larger departments. The 1985-86 evaluation of research performance conducted by the University Grants Committee of the United Kingdom contained a sampling error of this kind.

? Mccain, K.W. and Turner, K. (1989), Citation context analysis and aging patterns of journal articles in molecular-genetics. *Scientometrics*, **17** (1-2), 127-163.

Full Text: [1989\Scientometrics17, 127.pdf](1989/Scientometrics17,%20127.pdf)

Abstract: To compare citation history and contextual ‘importance,’ eleven highly cited axticles, 4 slowly aging (Type 1) and 7 quickly aging (Type 2), were ranked using an aggregate citation context measure, the Mean Utility Index. Based on citations in late (PY 6 & 7) source articles, ‘methods’ papers consistently ranked higher than papers cited for research results and theoretical implications, and Type 1 methods papers ranked above all Type 2 papers. A Type 1 paper representing an important theoretical concept could not be distinguished from Type 2 papers using citation context alone.

? Kryzhanovsky, L.N. (1989), Mapping the history of electricity. *Scientometrics*, **17** (1-2), 165-170.

Full Text: [1989\Scientometrics17, 165.pdf](1989/Scientometrics17,%20165.pdf)

Abstract: A mapping technique similar to that first used by J. D. *Bernal* and refined by E. *GarfieM* is applied to the historiography of electrical science. The usefulness of this technique for the historical research of scientific ideas is shown using examples of major developments in the 17th and 18th centuries.

? Schubert, A. (1989), Quantitative studies of science - A current bibliography. *Scientometrics*, **17** (1-2), 171-180.

Full Text: [1989\Scientometrics17, 171.pdf](1989/Scientometrics17,%20171.pdf)

? Moravcsik, M.J. (1989), Evaluating applied-research - lessons from Japan - Irvine, J. *Scientometrics*, **17** (1-2), 181-182.

Full Text: [1989\Scientometrics17, 181.pdf](1989/Scientometrics17,%20181.pdf)

Keywords: Japan

? Braun, T. (1989), Who reads scientometrics. *Scientometrics*, **17** (3-4), 193-194.

Full Text: [1989\Scientometrics17, 193.pdf](1989/Scientometrics17,%20193.pdf)

Keywords: Scientometrics

? Sen, S.K. (1989), Bibliographic scattering: A generalized source approach. *Scientometrics*, **17** (3-4), 197-204.

Full Text: [1989\Scientometrics17, 197.pdf](1989/Scientometrics17,%20197.pdf)

Abstract: So fax all the formulas or equations for the bibliographic scattering have been derived or ormulated through item approach. AS such, the selection is not randomised and there can not be any empty source. A source approach has been presented here with minimum of assumptions and conditions. An equation of scattering distribution is derived. If there are M sources and N items, the probabifity or the relative frequency of the sources with ith group items is given by *141(0 KM-i = CM -i* exp(-rM§ *~M].* Suggestions and procedures for experimental verifications have been sketched. Derivations from Bose-Einstein statistics with Gibrat’s law a 2 have been discussed and compared.

? Sen, S.K. (1989), A note on theoretical correlation between Bradfords Law and recently proposed linear-equation of the type R(R)=A.R-B. *Scientometrics*, **17** (3-4), 205-210.

Full Text: [1989\Scientometrics17, 205.pdf](1989/Scientometrics17,%20205.pdf)

Abstract: Some theoretical connections with Bradford’s law of scattering of articles in jgumals have been noted to substantiate the completely empirical linear formula, *R(r) = a.r-b* where r is the rank of a class of journals in increasing productivity, R is a typical function, called ‘mean relative scatter’ (MRS), of the class rank r, a and b are arbitrary constants. It is also shown that an exponential formula can be transformed to the linear one, thereby explicating certain constants and co-efficients of Bradford’s formula and the proposed one.

? Naranan, S. (1989), Power law version of Bradford Law - Statistical tests and methods of estimation. *Scientometrics*, **17** (3-4), 211-226.

Full Text: [1989\Scientometrics17, 211.pdf](1989/Scientometrics17,%20211.pdf)

Abstract: Is is shown, using rigorous statistical tests, that the number of journals *(J)* carrying p papers in a given subject can be expressed as a simple power law function *J(p) = K p’r, K* and y being constants. The standard maximum likelihood method of estimating 3’ has been suitably modified to take acoount of the fact that p is a discrete integer variable. The parameter 3’ entirely characterises the scatter of articles in journals in a given bibliography. According to a dynamic model proposed earlier by the author, 3’ is a measure of the relative rowth rates of papers and journals pertaining to the subject.

? Rajeswari, A.R. (1989), Forecasting of science and technology expenditure of India by simulation method. *Scientometrics*, **17** (3-4), 227-251.

Full Text: [1989\Scientometrics17, 227.pdf](1989/Scientometrics17,%20227.pdf)

Abstract: In this paper, an attempt has been made to forecast science and technology expenditure of India by simulation method as well as by regression method. The base data used are the average yearly growth rates of science and technology expenditure both at current and constant prices. For the regression analyses, the yearly growth rates of the gross national product at factor cost both at current and constant prices are used as independent variable. The forecast values of S&T expenditure have been given up to seven years from 1982-83, for both simulation method and regression method.

Keywords: India

Notes: TTopic

Sengupta, I.N. (1989), The growth of knowledge and literature in neuroscience. *Scientometrics*, **17** (3-4), 253-288.

Full Text: [1989\Scientometrics17, 253.pdf](1989/Scientometrics17,%20253.pdf)

Abstract: Knowledge and literature of neuroscience started growing steadly during the last few centuries. This paper aims to study the growth of knowledge in neuroscience as well as its literature. The first part of the paper, enumerates a historical survey of the growth of knowledge based on published data. This is done in view of the fact that a consolidated information at one place will be of great value to the students of scientometrics and also to the research scholars who are desirous to undertake research in this discipline. The second part of the paper is entirely based on experimental data which were collected to analyse the growth of literature of the subject. Neuroscience is notable for its wide range of approaches and techniques. In no other branch of research such a many sided approach is so essential. As a consequence last few decades have witnessed an accelerated research tempo and unprecedented growth of the literature on the subject covering its different sub-fields with gradual and systematic transgression of the conventional boundaries between them. To cope with the growth of literature, a new bibliometric technique has been applied to rank periodicals in the field based on 5785 citation data collected from the bibliographic data base published in the source journal namely, Annual Review of Neuroscience. It is expected that this list will reflect the impact of literature on the advancement of knowledge in the field of neuroscience. A striking feature of this study is the comparatively small contribution (8.8%) coming from the application of biochemical techniques and concepts to neuroscience research which differs from what we had noted earlier in the case of other biomedical disciplines. High position occupied by multidisciplinary science journals brings out the significance of now neuroscience research to science as a whole and confirms to importance of the category of journals in the dissemination of knowledge of the overall growth of science. Relatively low proportion, of citations of journals medicine, both general as well as specialities, in spite of direct relevance of much work in this field to neurological and mental illness reflects the preponderance of interest in the fundamental aspects of neuroscience research. Like other biomedical disciplines neuroscience literature also exhibits English as the most-preferred lingua franca of the subject, dominance of jouranals published from USA, UK, Germany and the Netherland, a wide scatter of cited literature showing the multidisciplinary approach characteristic of present-day neuroscience research. The results of this study support Bradford’s Law of Scattering and also Sengupta’s law of Bibliometrics. It is expected that the present ranking list will be of great help to the working neuroscientists to select a handful of core periodicals in the field for regular browsing from the viewpoint of their importance and significance as these core journals identify maximum segment of contemporary literature on the topics of direct relevance to their day to day research in the field.

? Sengupta, I.N. (1989), A weightage formula to rerank periodicals in the field of microbiology. *Scientometrics*, **17** (3-4), 289-300.

Full Text: [1989\Scientometrics17, 289.pdf](1989/Scientometrics17,%20289.pdf)

Abstract: Knowledge and literature of neuroscience started growing steadily during the last few centuries. This paper a’mas to study the growth of knowledge in neuroscience as well as its literat~e. The first part of the paper, enumerates a historical survey of the growth of knowledge based on published data. This iS done in view of the fact that a consolidated information at one place will be of great value to the students of scientometrics and also to the research scholars who are desirous to undertake research in this discipline. The second part of the paper is entirely based on experimental data which were collected to analyse the growth of literature of the subject.

Neuroscience is notable for its wide range of approaches and techniques. In no other branch of research such a manysided approach is so essential. As a consequence last few decades have witnessed an accelerated research tempo and unprecedented growth of the literature on the subject covering its different sub-fields with gradual and systematic transgression of the conventional boundaries between them. To cope with the growth of literature, a new bibliometric technique has been applied to rank periodicals in the field based on 5785 citation data collected from the bibliographic data base published in the source journal namely, *Annual Review of Neuroscience.* It is expected that this list will reflect the impact of literature on the advancement of knowiedge in the field of neuroscience. A striking feature of this study is the comparatively small contribution (8.8%) coming from the application of biochemical techniques and concepts to neuroseienee research which differs from what we had noted earlier In the case of other biomedical disciplines. High position occupied by multidisciplinary science journals brings out the significance of new neuroscienee research to science as a whole and confirms the importance of this category of journals in the dissemination of knowledge for the overall growth of science. Relatively low proportion, of citations of journals of medicine, both general as well as specialities, in spite of direct relevance of much work in this field to neurological and mental illness reflects the preponderance of interest in the funcamental aspects of neuroscience research. Like other biomedical disciplines neuroscience literature also exhibits English as the most-preferred lingua franca of the subject, dominance of journals published from USA, UK, Germany and the Netherland, a wide scatter of cited literature showing the multidisciplinary approach characteristic of present-day neuroseience research.: The results of this study support Bradford’s Law of Scattering and also Sengupta’s Law of Bibliometrics. It is expected that the present ranking list will be of great help to the working neuroscientists to select a handful of core periodicals in the field for regular browsing from the viewpoint of their importance and significance as these core journals identify maximum segment of contemporary literature on the topics of direct relevance to their day to day research in the field.

? Nagpaul, P.S. and Gupta, S.P. (1989), Effect of professional competence, managerial role and status of group leaders to R and D performance. *Scientometrics*, **17** (3-4), 301-331.

Full Text: [1989\Scientometrics17, 301.pdf](1989/Scientometrics17,%20301.pdf)

Abstract: This paper examines the following basic issues of leadership in research units: (1) characteristics of the leader and the functions performed by him that predict the image of his quality, and (2) the role of leadership in enhancing the performance of the research unit. Analysis is based on data collected on 1460 research units in six countries for the second round of International Comparative Study on Organization and Performance of Research Units. Variations in the characteristics and role of leadership in different institutional settings and countries are analyzed through POSCOR (ranking programme based on partially ordered sets). Stepwise multiple regression analysis was used to examine the common pattern of relationship of various indices of leadership with the image of leader’s quality and three measures of effectiveness - scientific, user-oriented and administrative. Analysis was repeated for each country to explore the stability in the pattern of relationships and to identify universal indices that have consistent relationships across countries. Implications of the results are discussed,

? Singh, P. and Krishnaiah, V.S.R. (1989), Analysis of work climate perceptions and performance of research and development units. *Scientometrics*, **17** (3-4), 333-351.

Full Text: [1989\Scientometrics17, 333.pdf](1989/Scientometrics17,%20333.pdf)

Abstract: This paper reports findings from a study on the perceptions of work climate and the patters of relationships between work climate dimensions and performance of research and development units in six countries. The study is based on the analysis of the subset of date collected in Argentina, Egypt, India, Republic of Korea, Poland and UkSSR for the second round of International Comparative Study on the Organization and Performance of Research Units. The following dimensions of work climate have been usec: morale, openness, job satisfaction, work contacts, career opportunities, Satisfaction with supervisor, information on research plans, research autonomy. Stepwise regression analyses were carrier out separately for each country and also on global sample to find out the important dimensions of work climate in explaining the variations in the performance of R&D units. The set of work climate dimensions are related separately for tvr different measures Of performance of research’ units, viz. (1) scientific effectiveness, and (2)user-oriented effectiveness. The implications of this study for management of research and development groups are discussed.

Notes: CCountry

Kumari, L. and Sengupta, I.N. (1989), Growth of Lectin literature 1954-1982. *Scientometrics*, **17** (3-4), 353-362.

Full Text: [1989\Scientometrics17, 353.pdf](1989/Scientometrics17,%20353.pdf)

Abstract: Lectins, the carbohydrate binding proteins, have emerged as indispensable biological tools in the last decade. Research contributions covering the period 1954-1982 on different aspects of lectins were collected since the introduction of the tem ‘Lectin’ in 1954. In the present communication we have made a bibliometric analysis of the growth of the literature on lectins, the trend of authorship of papers on lectins, and scattering phenomena. We have also identified the main international channels of communication of the results of lectin research.

? Satyanarayana, K. and Ratnakar, K.V. (1989), Authorship patterns in life sciences, preclinical basic and clinical research papers. *Scientometrics*, **17** (3-4), 363-371.

Full Text: [1989\Scientometrics17, 363.pdf](1989/Scientometrics17,%20363.pdf)

? Schubert, A. (1989), Quantitative studies of science a current bibliography. *Scientometrics*, **17** (3-4), 373-380.

Full Text: [1989\Scientometrics17, 373.pdf](1989/Scientometrics17,%20373.pdf)

? Shenhav, Y.A., Haberfeld, Y. and Cohen, B.P. (1989), Contextual analysis of team productivity in the R & D industry. *Scientometrics*, **17** (5-6), 387-400.

Full Text: [1989\Scientometrics17, 387.pdf](1989/Scientometrics17,%20387.pdf)

Abstract: We argue that productivity is a phenomenon which takes on various meanings in different contexts. Reliability coefficients of six scales of productivity, four of which have been used by Andrews and/or by Pelz and Andrews, are estimated in 28 work contexts using data on 224 R & D teams. The results support the argument.

? Pouris, A. (1989), A scientometric assessment of agricultural research in South Africa. *Scientometrics*, **17** (5-6), 401-413.

Full Text: [1989\Scientometrics17, 401.pdf](1989/Scientometrics17,%20401.pdf)

Abstract: This article reports the results of a scientometric assessment of agricultural research in South Africa over the period 1974-1984. The Science Literature Indicators Database of CHI is used and South Africa is compared with 7 other countries spread in America, Asia, Oceania, and Africa. The criteria used for the assessment are the contribution of each country to international agricultural literature (in terms of publications) and their impact in the “Schubert-Glänzel-Braun Impact Scale”. It was found that, although the South African contribution has improved in that period, it is comparable to that of Brazil and Argentina, that Nigeria and Israel produce 3 times more, and: that Australia and Canada contribute more than one order of magnitude of publications more than South Africa. As far as research impact is concerned “Hant Science” research in South Africa is rated “fair” in the Schubert-Glänzel-Braun scale, whilst “Dairy and Animal Science” and “Veterinary” research are rated “poor”.

Keywords: South Africa

? Vanels, W.P., Jansz, C.N.M. and Lepair, C. (1989), The citation gap between printed and instrumental output of technological research: The case of the electron microscope. *Scientometrics*, **17** (5-6), 415-425.

Full Text: [1989\Scientometrics17, 415.pdf](1989/Scientometrics17,%20415.pdf)

Abstract: The merits and shortcomings of bibliometric evaluation techniques are well known, the reliability of the techniques varies according to the discipline. For technology the reliability is small. The electron microscope is a clear case of extreme mismatch between the number of citations received and the impact of the instrument in a wide area of science. The instrument is comparable to a scientific publication in the way in which it is used and referred to in the literature. In this paper we estimate the size of the citation gap, i.e. the number of citations an author misses because the results of his research are made public in the form of an instrument instead of via an article in a journal.

? Nederhof, A.J. and Vanraan, A.F.J. (1989), A validation study of bibliometric indicators: The comparative performance of cum laude doctorates in chemistry. *Scientometrics*, **17** (5-6), 427-435.

Full Text: [1989\Scientometrics17, 427.pdf](1989/Scientometrics17,%20427.pdf)

Abstract: The validity of bibliometric indicators as a monitor of the impact and usefulness of scientific research is examined by compaiing the scientific performance of cure laude and non-cum laude degree holders in chemistry (N=237), from five y~ears before their graduation to four years afterwards. Papers of cum laudes were cited more frequently than those of non-cum laudes from three years before graduation until one year after graduation. Two to three years after graduation, the short-term impact per paper was no longer significantly different for both groups. A similar pattern was found with regard to productivity. Little evidence was found in favor of the Ortega hypothesis and the Matthew effect. The results support the concurrent validity of bibliometric indicators with peer review indicators of quality of the research project.

? Chatelin, Y. and Arvanitis, R. (1989), Between centers and peripheries - the Rise of a new scientific community. *Scientometrics*, **17** (5-6), 437-452

Full Text: [1989\Scientometrics17, 437.pdf](1989/Scientometrics17,%20437.pdf)

Abstract: This article analyzes the production and diffusion of the scientific products of sixty-one researchers in soil sciences belonging to ORSTOM. In a period corresponding to two scientific generations we have observed important changes in writing and publishing habits. Non-published reports have lost importance while article production has grown. Also there is a noteworthy growth of the number of presentations at meetings, most of them international scientific congresses. The article shows the result of a factor analysis of their production that allows us to identify seven different types of behavior. We have stressed a series of elements explaining these different types. The possible predominance of a nationally oriented production behavior can be mainly explained by easy access to publication, sufficient appropriateness to the kind of data studidd, and correct recognition by scientific peers. Finally we suggest that this typology can be used for analytical purposes in order to study the growth and publication patterns of Third World science.

? Czerwon, H.J. (1990), Scientometric indicators for a specialty in theoretical high energy physics: Monte carlo methods in lattice field theory. *Scientometrics*, **18** (1-2), 5-20.

Full Text: [1990\Scientometrics18, 5.pdf](1990/Scientometrics18,%205.pdf)

Abstract: Publication and citation data are used to analyse the dynamics of the theoretical highenergy physics.specialty “Monte Carlo methods in lattice field theory”. The present study is based on a comprehensive bibliography of the given subject area for the six-year period 1979-1984 and the 1979-1985 citations to these papers. The application of a recently introduced set of scientomettic indicators provides clues to undertanding the growth of a new research specialty from a core body of seminal literature.

Keywords: Monte Carlo

? Bruckner, E., Ebeling, W. and Scharnhorst, A. (1990), The application of evolution models in scientometrics. *Scientometrics*, **18** (1-2), 21-41.

Full Text: [1990\Scientometrics18, 21.pdf](1990/Scientometrics18,%2021.pdf)

Asbtract: According to the connection between field mobility and coupled manpower growth processes in a system of scientific fields a deterministic, stochastic and continuous version of an evolution model is presented. Some simulation results on base of the stochastic model are given in Section 5 and compared with corresponding trend analyses of the deterministic model. Several interesting effects, as delayed growth and temporal disappearance as well as rapid growth and overshooting of a new field, axe shown by the simulations.

Keywords: Scientometrics

? Kretschmer, H. and Muller, R. (1990), A contribution to the dispute on the Ortega hypothesis: Connection between publication rate and stratification of scientists, tested by various methods. *Scientometrics*, **18** (1-2), 43-56.

Full Text: [1990\Scientometrics18, 43.pdf](1990/Scientometrics18,%2043.pdf)

Abstract: It was tested whether the publication rate of scientists as a rough measure of their Ueniinence”, influences their stratification. The stratification is reflected in cooperation, in co-authorships, in the structure of the citations and in the distribution of publications among the various problem areas of a scientific discipline. The findings of these investigations was discussed as a contribution to the dispute among authors who accept or reject the Ortega hypothesis which states that the research done by average scientists substantially contributes to the advance of science.

? Bonitz, M. (1990), Journal ranking by different parameters. Part I. Collectivity and selective collectivity: Two Ranking parameters reflecting the structure of a journal network. *Scientometrics*, **18** (1-2), 57-73.

Full Text: [1990\Scientometrics18, 57.pdf](1990/Scientometrics18,%2057.pdf)

Abstract: In the course of the study of scientific journals’ rank distributions two new parameters are def’med reflecting collective properties of journals in a network where the journals are linked to each other through co-usage of user profiles for which they contain relevant papers. The first, Collectivity C is a mere structure parameter whereas Selective Collectivity N.C uses C of a journal as a weight factor for the number of hits N produced in a retrospective search in a data file. The corresponding rank distributions show besides the expected reranking effect considerable deviations from a distribution where ranking is done according to the parameter Selective Journal Productivity N.

? Bonitz, M. (1990), Journal ranking by different parameters. Part II. Individual or collective: Which parameters are best suited for journal ranking? *Scientometrics*, **18** (1-2), 75-93.

Full Text: [1990\Scientometrics18, 75.pdf](1990/Scientometrics18,%2075.pdf)

Abstract: For the first time the impact of different ranking parameters on one and the same experimentally achieved set of 610 jouxnals is studied. Significance of the three journal rankiflg parameters Selective Journal Productivity, Selective Impact, and Collectivity is established. Significant parameters cause strong re-ranking in journal rank distributions and, in the transition between individual” and collective parameters, also in the shape of the cumulated curves. No parameter can replace an other one, each carries essential information on the communication process. The author’s concept is open for retire parameters and pronounces the role of man in decision making. The connection between simple behavioral principles and scientometrics is emphasized. The holography principle and the maximum speed principle are claimed to be most promising.

? Kretschmer, H. (1990), Pinski’s citation based measures of research interactivity and the application of a complex structure measure to journal systems. *Scientometrics*, **18** (1-2), 95-122.

Full Text: [1990\Scientometrics18, 95.pdf](1990/Scientometrics18,%2095.pdf)

Abstract: The supposition for Pinski’s measures of research interactivity is a size reduced form of a citation matrix, which makes it possible to compare journals of different sizes. A futher development of the measures of research interactivity can be achieved by using a complex structure measure. In addition to the relative scope of citations, which is taken into consideration by Pinski’s measures, the distributions of these values on the elements of the matrix are involved in calculating new measures of interactivity whose content is different from that of Pinski’s measures.

? Peschel, M., Mende, W. and Albrecht, K.F. (1990), The evolon growth model: Possible scientometric evaluations. *Scientometrics*, **18** (1-2), 123-136.

Full Text: [1990\Scientometrics18, 123.pdf](1990/Scientometrics18,%20123.pdf)

Abstract: Based on a lot of data-analyses from different areas including also scientometries (Mathematical publications) a new method for description of growth indicators in highly aggregated societal systems is proposed’based on the sigmoid EVOLON growth model and its degenerated forms which together include most of the until now used growth curves in different fields. For these models simulation procedures are described which give us options for the parameter identification. Beside these possibilities dosed analytical formulas are derived for all the parameters which make use of higher derivatives of the sequence of measured values of the considered growth indicator. With this possibility the identification problem is used for the construction of reliable estimators for derivatives up to some order from measured sequences of growth indicator values. At the end of paper a certain view is thrown on new possibilities fox the construction of networks for coupled growth processes offerring also identification possibilities.

? Meske, W. and Dealaiza, M.C.F. (1990), Structure and development of the scientific and technological potential in the Republic of Cuba. *Scientometrics*, **18** (1-2), 137-155.

Full Text: [1990\Scientometrics18, 137.pdf](1990/Scientometrics18,%20137.pdf)

Abstract: Scientific statistics provides the foundations necessary for every sciences policy. Against this background, special problems are posed for the developing countries. Below you find a presentation and discussion of experiences gained and results obtained in the course of the build-up of statistics on science and technology in the Republic of Cuba, with assessments and conclusions drawn from an analysis into tile data so far available. Therefore this paper is dealing with the scientific and technological potential of Cuba as a whole (S/T) without providing any distinction, between sciences and technology.

? Schubert, A. (1990), Quantitative studies of science a current bibliography. No. 15. *Scientometrics*, **18** (1-2), 157-168.

Full Text: [1990\Scientometrics18, 157.pdf](1990/Scientometrics18,%20157.pdf)

? Schubert, A., Glänzel, W. and Braun, T. (1990), World flash on basic research - scientometric datafiles supplementary indicators on 96 countries 1981-1985. 1. Distribution of publication types in an extended source set. *Scientometrics*, **18** (3-4), 173-177.

Full Text: [1990\Scientometrics18, 173.pdf](1990/Scientometrics18,%20173.pdf)

? Schubert, A., Glänzel, W. and Braun, T. (1990), World flash on basic research - scientometric datafiles supplementary indicators on 96 countries 1981-1985. 1. Distribution of publication types in an extended source set. *Scientometrics*, **18** (3-4), 173-177.

Full Text: [1990\Scientometrics18, 173.pdf](1990/Scientometrics18,%20173.pdf)

? Kunz, M. (1990), Can the lognormal distribution be rehabilitated? *Scientometrics*, **18** (3-4), 179-191.

Full Text: [1990\Scientometrics18, 179.pdf](1990/Scientometrics18,%20179.pdf)

Abstract: Some properties of the logarithmic-factorial distribution [the normal distribution with a substitution X = log10 log2 (ma + l)!] are shown. This distribution was connected with the distribution of entropy inside information systems. For practical purposes, the graphical form of the lognormai distribution is recommended and deviations from linearity, at examples of distributions of patents between patentees, are explained as convolutions of distributions.

? Nordstrom, L.O. (1990), ‘Bradford’s law’ and the relationship between ecology and biogeography. *Scientometrics*, **18** (3-4), 193-204.

Full Text: [1990\Scientometrics18, 193.pdf](1990/Scientometrics18,%20193.pdf)

Abstract: Core journals in ecology and biogeography were identified on the basis of Bradford’s Law of Scattering, and their degree of overlap measured as percentage Similarity (PS). Areas of common interest between the two disciplines, as well as of uniqueness, were determined through bibliometric analysis of these core journals.

? Spagnolo, F. (1990), Brazilian scientists’ publications and mainstream science: Some policy implications - the case of chemical and electrical engineering. *Scientometrics*, **18** (3-4), 205-218.

Full Text: [1990\Scientometrics18, 205.pdf](1990/Scientometrics18,%20205.pdf)

Abstract: Against the common view that scientific output in peripheral and non-English speaking countries is largely underrepresented in Science Citation Index (SCI), this study shows that academic Brazilian scientists in chemistry and electrical engineering tend to publish in “good” international journals covered by SCL The rate of citations they earn, however, looks rather poor. The reasons why Brazilian scientists publish in foreign journals are analysed and the policy of encouraging scientists to publish their best contributions abroad is questioned.

? Grupp, H. (1990), The concept of entropy in scientometrics and innovation research an indicator for institutional involvement in scientific and technological developments. *Scientometrics*, **18** (3-4), 219-239.

Full Text: [1990\Scientometrics18, 219.pdf](1990/Scientometrics18,%20219.pdf)

Abstract: The concept of entropy well-known in information theory and thermodynamics is applied in the fields of scientometrics and innovation research in order to introduce an indicator for the institutional involvement in of the location of research and development. By means of this concept four applications in the fields of research and national technology policy, industrial technology management, and innovation research are outlined. First, the national institutional structures in telecommunications research and development in Japan are compared to those of the Netherlands. It is concluded that the institutional involvement is not always more random in a larger country but rather depends on the disaggregation into fields and subfields. Secondly, broad versus narrow national technology strategies in the so-called ‘high technologies’ are compared for various OECD and COMECON countries. Thirdly, corporate R and D strategies of Japanese telecommunication companies are studied. Fourthly, for selected R and D-intensive technologies it is shown that with the progress of time the involvement of industrial branches in a new technology fluctuates. The four analyses are based either on bibliometric or on patent data. The usefulness of the concept of entropy in scientometrics and innovation research is assessed through these examples.

Keywords: Scientometrics

? Spangenberg, J.F.A., Buijink, W. and Alfenaar, W. (1990), Some incentives and constraints of scientific performance in departments of economics. Part I. Predictor-criterion relations. *Scientometrics*, **18** (3-4), 241-268.

Full Text: [1990\Scientometrics18, 241.pdf](1990/Scientometrics18,%20241.pdf)

Abstract: The main purpose of this paper is to explore why publication records differ among Dutch departments of economics. The results of a large scale performance evaluations have been used for classifying research units in subsamples of high and low performers. After collecting data on organizational characteristics of economics research units, univariate and multivariate statistics have been applied to test hypotheses regarding determinants of scientific productivity in economics.

The extreme clannishness, not to say xenophobia, of the Econ makes life among them difficult and perhaps even somewhat dangerous for the outsider. This probably accounts for the fact that the Econ have so far not been systematically studied (...) More research on this interesting tribe is badly needed.

? Spangenberg, J.F.A., Breemhaar, B., Nijhuis, F. and Alfenaar, W. (1990), Some incentives and constraints of scientific performance in economics. Part II. Validity and sensitivity analysis. *Scientometrics*, **18** (3-4), 269-279.

Full Text: [1990\Scientometrics18, 269.pdf](1990/Scientometrics18,%20269.pdf)

Abstract: Spangenberg, et al. have tested hypotheses concerning facilitators and inhibitors of scientific performance in Dutch economics. In order to examine the external validity of the findings, a comparison is made with large scale empirical studies conducted in two other countries. In order to examine the convergent validity of the overall performance measure, the relationship with other scientometric indicators is inspected. In order to test the robustness of their univariate and multivariate tests, multiple regressions were performed on three criteria: scientific productivity, citation impact, and individual performance index.

? Leydesdorff, L. (1990), Relations among science indicators or more generally among anything one might wish to count about texts. I. The static model. *Scientometrics*, **18** (3-4), 281-307.

Full Text: [1990\Scientometrics18, 281.pdf](1990/Scientometrics18,%20281.pdf)

Abstract: In a series of two articles, I will show that the expected information content of distributions provides us with a straightforward means to develop a static and a dynamic model for the development of the sciences. In the first study, I analyze how knowledge about one indicator (nominal variable) can reduce our uncertainty in the prediction of other indicators, and how relations across various levels of aggregation can be assessed. In the second study, I will address the problem of the use of indicators and relations among them for predictions and reconstructions.

I will use the occurrences of words in texts as the prime nominal variable which can be easily counted by the machine. However, I will generalize the models for the multi-variate case, in which any indicator or nominal variable can be assessed in terms of its validity in relation to other indicators and its value for predictions.

? Urata, H. (1990), Information flows among academic disciplines in Japan. *Scientometrics*, **18** (3-4), 309-319.

Full Text: [1990\Scientometrics18, 309.pdf](1990/Scientometrics18,%20309.pdf)

Abstract: An attempt is made to clarify the relationships among disciplines by examining the flow of citation and the migration of scholars in the humanities and social sciences in Japan. The results of both methods are consistent with each other. In humanities and social sciences in Japan, distinct hierarchical relationships are recognized between disciplines offering much information to other disciplines and disciplines obtaining much information from other disciplines.

Keywords: Japan

? Lyon, W.S. (1990), The dreams of reason - The computer and the rise of the science of complexity - Pagels, HR. *Scientometrics*, **18** (3-4), 321-322.

Full Text: [1990\Scientometrics18, 321.pdf](1990/Scientometrics18,%20321.pdf)

Abstract: The fit of Bradford’s Law to bibliometrics - a field which is both interdisciplinary and relatively new was investigated. It is found that, contrary to expectations, the data fit Bradford’s Law very well, particularly in the more recent period, 1979-1983. There are, in both periods studied, seven core journals with about 30% of the papers, most of these journals are specialized in information science or documentation. No “falling away” from Bradford’s distribution towards the right-hand end of the bibliography was observed.

? Peritz, B.C. (1990), A Bradford distribution for bibliometrics. *Scientometrics*, **18** (5-6), 323-329.

Full Text: [1990\Scientometrics18, 323.pdf](1990/Scientometrics18,%20323.pdf)

Keywords: Bibliometrics

? Over, R. (1990), The scholarly impact of articles published by men and women in psychology journals. *Scientometrics*, **18** (5-6), 331-340.

Full Text: [1990\Scientometrics18, 331.pdf](1990/Scientometrics18,%20331.pdf)

Abstract: In considering whether men and women produce research of equal quality, it needs to be asked not whether similar numbers of important contributions come from men and women (since numerically there have been more men than women among researchers), but whether the proportion of women active in research who make important contributions is the same as the proportion of men active in research who make important contributions. A search of entries in the 1985 edition of Social Sciences Citation Index located 564 articles from psychology journals which had attracted 15 or more citations. The sex ratio among senior authors of these high-impact articles was compared with the sex-ratio among senior authors of low-impact articles published in the same journals. The majority of high-impact articles had been published by men, but so had most low-impact articles. When allowance was made for the different numerical representation of the two sexes among authors, there was no evidence that men and women differ in terms of the impact of articles they publish. The results are discussed in the context of methodological issues in evaluation of sex differences in scientific performance, as well as with reference to the limited recognition that women so far have gained for research achievement in psychology.

? Gupta, B.M., Sharma, S.C. and Mehrotra, N.N. (1990), Subject-based publication activity indicators for medicinal and aromatic plants research. *Scientometrics*, **18** (5-6), 341-361.

Full Text: [1990\Scientometrics18, 341.pdf](1990/Scientometrics18,%20341.pdf)

Abstract: The paper analyses 2339 research papers appearing in 330 journals covered in Medicinal and Aromatic Plants Abstracts, India (1983) on the basis of their broad subject fields such as agronomy, phytochemistry, pharmacology and clinical research, their country of origin, plant genera and their species, and by type of investigation. Under each of the broad subject fields and major genera, an attempt has been made to identify the nature and focus of research in different countries through minimal level content analysis. Special focus of the paper has been the analysis of Indian publication output.

? Karki, M.M.S. (1990), Environmental science research in India: An analysis of publications. *Scientometrics*, **18** (5-6), 363-373.

Full Text: [1990\Scientometrics18, 363.pdf](1990/Scientometrics18,%20363.pdf)

Abstract: Investigates the trends in environmental science research in India with regard to its various branches, channels of communication used, authorship pattern of the papers, institution-wise output, rank of journals, extent of collaboration and scholarship of papers basing the entries noticed in the Paryavaran Abstracts. Major areas of interest of Indian environmentalists are given and prolific investigators have been listed. Journals used by Indian workers for publication of their work are studied. Subject areas with number of papers, number of authors, and average authorship are tabulated.

Keywords: India

? Mychkomegrin, A.Y. (1990), Estimates of the annual total number of titles on medicine and its disciplines and scientific productivity of physicians. *Scientometrics*, **18** (5-6), 375-388.

Full Text: [1990\Scientometrics18, 375.pdf](1990/Scientometrics18,%20375.pdf)

Abstract: Two scientometric indices are reviewed: number of printed scientific works per 100 specialists per year and number of scientific journals per 1000 specialists. In 1973-1977 Brazilian chemists and pharmacologists published 15.8 scientific works per 100 specialists per year, in 1981-1985 Japanese physicians - 17.1 ones, in 1968-1986 Czechoslovakian physicians - 17.1 ones, in 1978-1986 Hungarian physicians - 18.3 ones, in 1963-1979 Polish physicians - 18.5 ones, in 1983 Yugoslavian physicians - 20.1 titles per 100 specialists. In 1986 in USA 7.2 biomedical journals were issued per 1000 physicians, in Japan - 3.4 ones, in Spain - 1.8 biomedical journals per 1000 physicians. In 1986 in USA 6.8 dental periodicals were published per 1000 dentists, Great Britain - 3.0 ones, in Canada - 2.6 ones, in Spain - 2.0 dental journals. The total number of world’s biomedical articles and books’ titles was 535,000 in 1967, 628,000 in 1972, 820,000 in 1978, 1.01 million ones in 1983 and 1.13 million titles in 1986.

? Spangenberg, J.F.A. and Nijhuis, F.J.N. (1990), Human information processing in science. *Scientometrics*, **18** (5-6), 389-407.

Full Text: [1990\Scientometrics18, 389.pdf](1990/Scientometrics18,%20389.pdf)

Abstract: Human information processing in science is explored by observation of success and failure attributions of scientists in a Dutch university sample. Scientific performance is measured by various bibliometric indicators, while attribution theory has been used for the classification of perceived causes of performance. Low performers appear to attribute their success and failure more to external than to internal causes as compared to high performers.

? Trofimenko, A.P. (1990), Scientometric analysis of the topical content of scientific research and its particularities. *Scientometrics*, **18** (5-6), 409-435.

Full Text: [1990\Scientometrics18, 409.pdf](1990/Scientometrics18,%20409.pdf)

Abstract: A new method for quantitative evaluation of the topical content of scientific research is proposed. The method is based on the analysis of the number and topic of publications in different fields. A mathematical model, describing the connection between level and width of research, between topic renewal and concentration of research is developed. Furthermore, coefficients characterizing various aspects of research are introduced. The theoretical conclusions fit well the factual data obtained from the INIS system. A nucleus of terms defining the most developed directions of research is found in each case. The analysis indicates that the growth rate of publications cannot serve as a reliable criterion of research topicality.

? Ehikhamenor, F.A. (1990), Productivity of physical scientists in Nigerian universities in relation to communication variables. *Scientometrics*, **18** (5-6), 437-444.

Full Text: [1990\Scientometrics18, 437.pdf](1990/Scientometrics18,%20437.pdf)

Abstract: The central activity on which scientific enterprise revolves and is sustained is communication. Under normal circumstances, there is a correlation between the output of a scientist in terms of publications and the amount of time spent in communicating with other scientists or the extent of his contacts with other scientists. This relationship was investigated among physical scientists in some Nigerian universities, but the results do not substantiate it. This can be attributed to a host of constraints being experienced by the scientists in their research and communication activities. Consequently, performance in these activities is inconsistent and unpredictable, and so, there can be no systematic relationship between productivity and communication activities.

? Schubert, A. (1990), Quantitative studies of science a current bibliography. *Scientometrics*, **18** (5-6), 445-463.

Full Text: [1990\Scientometrics18, 445.pdf](1990/Scientometrics18,%20445.pdf)

? Schubert, A. and Braun, T. (1990), International collaboration in the sciences, 1981-1985. *Scientometrics*, **19** (1-2), 3-10.

Full Text: [1990\Scientometrics19, 3.pdf](1990/Scientometrics19,%203.pdf)

? Klaic, B. (1990), Scientometric analysis of the research activities of chemists from the Rugjer-Boskovic-Institute (Yugoslavia), 1976-1985. *Scientometrics*, **19** (1-2), 11-24.

Full Text: [1990\Scientometrics19, 11.pdf](1990/Scientometrics19,%2011.pdf)

Abstract: The research activity of chemists from the “Rugjer Bogkovid” Institute (RBI, Zagreb, Yugoslavia) was analyzed for the period 1976-1985, covering 2018 research years of scientific work, and 1149 SCI registered papers (0.57 publications per research year). At the average, one paper was published by 3.05 scientists. The papers were published in 235 different journals, most frequently is the national Croatica Chemica Acta (171 papers). The publications were divided into two groups: for the periods 1976-1980 and 1981-1985, and for each paper citations were collected in the respective time period. An average publication had 2.58 citations. Chemical papers from the second period had 2.73 citations per paper, which is 85% of the expected value, and this was considerably more than for Yugoslav papers (66%) in general. The papers were classified according to the subfields used in the Journal Citation Reports, and the results compared with the data published by Schubert, Gldnzel and Braun. The distribution of citations was also analyzed.

Keywords: Yugoslavia

? So, C.Y.K. (1990), Openness index and affinity index - 2 New citation indicators. *Scientometrics*, **19** (1-2), 25-34.

Full Text: [1990\Scientometrics19, 25.pdf](1990/Scientometrics19,%2025.pdf)

Abstract: This article discusses some design issues in the self-citing rate and the self-cited rate proposed by the Social Sciences Citation Index for journals. Improvements on the above measures lead to two new citation indicators-the Openness Index and the Affinity Index. These new indices could be expressed in terms of several components (self, own-field, otherfield, overall). Each of these components indicates more specific citation situations of a journal. The application of these new citation indicators is illustrated in the measurement of some journals’ characteristics in the field of communication.

? Todorov, R. and Winterhager, M. (1990), Mapping Australian geophysics - A co-heading analysis. *Scientometrics*, **19** (1-2), 35-56.

Full Text: [1990\Scientometrics19, 35.pdf](1990/Scientometrics19,%2035.pdf)

Abstract: Descriptive capacities of a new bibliometric method, namely co-heading analysis, are investigated. The method uses the appearance and co-appearance of classification subdivisions (headings) in the document records of 1988 INSPEC database to display correspondingly the main topics of Australian geophysics and their links. The findings, in the form of inclusion maps (resulting from multidimensional scaling and cluster analysis) provide new insights into geophysics national activity and into its structure.

? Uzun, A. (1990), A quantitative-analysis of Turkish publication output in physics between 1938-1987. *Scientometrics*, **19** (1-2), 57-73.

Full Text: [1990\Scientometrics19, 57.pdf](1990/Scientometrics19,%2057.pdf)

Abstract: The output of a total of 860 publications in physics for the period 1938-1987 is used to analyse the mainstream of physics research in Turkey. The productivity and growth characteristics of the research in experimental and theoretical areas as well as in different subfields and institutions in the country are briefly discussed. The total output is also assessed by its citation impact.

? Miao, Q.H. and Zhang, Z.Z. (1990), Anatomy of Jetro’s overseas technology monitoring: Bibliometric and content analysis. *Scientometrics*, **19** (1-2), 75-90.

Full Text: [1990\Scientometrics19, 75.pdf](1990/Scientometrics19,%2075.pdf)

Abstract: By means of bibliometrics and content analysis, both quantitative and qualitative, based upon JETRO Technology Bulletin data-base, the authors reveal some properties of overseas monitoring for industrial technology and technology policy by Japan External Trade Organization (JETRO), specifically, identify the shift of focus in regional and technical field dimensions, depict the different modes of representative technical areas, and trace the relation between technology monitoring and government policy action.

? Hargens, L.L. and Herting, J.R. (1990), Neglected considerations in the analysis of agreement among journal referees. *Scientometrics*, **19** (1-2), 91-106.

Full Text: [1990\Scientometrics19, 91.pdf](1990/Scientometrics19,%2091.pdf)

Abstract: Studies of representative samples of submissions to scientific journals show statistically significant associations between referees’ recommendations. These associations are moderately large given the multidimensional and unstable character of scientists’ evaluations of papers, and composites of referees’ recommendations can significantly aid editors in selecting manuscripts for publication, especially when there is great variability in the quality of submissions and acceptance rates are low. Assessments of the value of peer-review procedures in journal manuscript evaluation should take into account features of the entire scholarly communications system present in a field.

? Stevens, G. (1990), The flow of information between languages: An application of price’s method. *Scientometrics*, **19** (1-2), 107-126.

Full Text: [1990\Scientometrics19, 107.pdf](1990/Scientometrics19,%20107.pdf)

Abstract: Among Derek de Solla Price’s many contributions to scientometrics is a method for analysing matrices whose terms represent flow of some kind. The relative contributions of languages to the international flow of intellectual capital are analysed using this method. Translations are examined by UDC category to determine the types of capital exported by languages. It is shown that the world’s major languages export across the whole spectrum of intellectual endeavour, and that minor languages tend to specialise in a few categories. An examination of the links between languages, as shown by translation flows, shows that most transmit information into only a small number of other languages.

? Courtial, J.P. and Michelet, B. (1990), A mathematical model of development in a research field. *Scientometrics*, **19** (1-2), 127-141.

Full Text: [1990\Scientometrics19, 127.pdf](1990/Scientometrics19,%20127.pdf)

Abstract: We use co-word analysis in a retrospective study of the transformation of the knowledge network in the field of polymer science from 1973 to 1976. The results of this study lead us to propose a model of change in the field. This model is based on the observation that the interaction of Several networks gives rise to a sub-network that is at first central and then - and this is what the model allows us to predict - central and developed (without its precise content being predictable). Such sub-networks begin in regions of the network of central associated words where there are numerous holes or incomplete links. The model appears to be sufficiently robust statistically that it does not miss significant transformations and it suggests a way of predicting knowledge development. A comparison is made with other models of network transformation, such as the contagion model and the model of local structural equivalence.

? Shaw, A. (1990), Comments on brookes, Bertram, C., recipient of the 1989 Price, Derek, Desolla Award. *Scientometrics*, **19** (3-4), 153-155.

Full Text: [1990\Scientometrics19, 153.pdf](1990/Scientometrics19,%20153.pdf)

? Todorov, R. (1990), Comments on Vlachy, Jan, recipient of the 1989 Price, Derek, Desolla Award. *Scientometrics*, **19** (3-4), 157-158.

Full Text: [1990\Scientometrics19, 157.pdf](1990/Scientometrics19,%20157.pdf)

? Braun, T. and Glänzel, W. (1990), A topographical approach to world publication output and performance in the sciences, 1981-1985. *Scientometrics*, **19** (3-4), 159-165.

Full Text: [1990\Scientometrics19, 159.pdf](1990/Scientometrics19,%20159.pdf)

? Luukkonen, T. (1990), Publication structures and accumulative advantages. *Scientometrics*, **19** (3-4), 167-184.

Full Text: [1990\Scientometrics19, 167.pdf](1990/Scientometrics19,%20167.pdf)

Abstract: The paper examines the role played by the scientific journal in the citation process. It compares characteristics of journals which publish the articles cited and those which cite them. It pays attention to the regional location, degrees of specialization, and visibility of journals and investigates how these factors relate to accumulation of citations. The data consist of a subsample of Nordic cardiovascular research articles, published in 1981, and of the articles citing them until early 1988.

? Plomp, R. (1990), The significance of the number of highly cited papers as an indicator of scientific prolificacy. *Scientometrics*, **19** (3-4), 185-197.

Full Text: [1990\Scientometrics19, 185.pdf](1990/Scientometrics19,%20185.pdf)

Abstract: After presenting arguments that the number of highly cited papers (HCPs, 25 or more citations) has some advantages as an indicator of an author’s scientific impact, the paper discusses citation data of 338 university professors in departments of medicine in the Netherlands. An analysis of the distribution of HCPs over the years provides support for the following conclusions: (1) prolific researchers with a large number of HCPs usually manifest themselves already in their Ph.D. work, apparently almost independent of the scientific setting, (2) it cannot be taken for granted that a successful Ph.D. student with some HCPs connected with his/her doctoral thesis will become a prolific successful researcher, (3) it is unlikely that an unsuccessful Ph.D. student without HCPs connected with his/her doctoral thesis will turn out to be a prolific successful researcher,, and (4) for researchers, just as for artists, sportsmen, etc., talent is the most decisive factor in being successful.

? Peritz, B.C. (1990), The citation impact of funded and unfunded research in economics. *Scientometrics*, **19** (3-4), 199-206.

Full Text: [1990\Scientometrics19, 199.pdf](1990/Scientometrics19,%20199.pdf)

Abstract: Is research which receives grant support more cited than unfunded research? The answer to this question for the field of economics is - at least tentatively - affirmative. However, in pursuing this query several methodological questions are encountered and discussed, ranging from the choice of the statistical model and of the population, through the control of covariates, to the selection of the unit of investigation. It is suggested that, in spite of their limitations, small bibliometric studies of selected populations, which control for at least some of the relevant covariates, might become a helpful tool in clarifying some issues in science policy.

? Hogan, T.J. (1990), A measure of accounting faculties and doctoral programs. *Scientometrics*, **19** (3-4), 207-221.

Full Text: [1990\Scientometrics19, 207.pdf](1990/Scientometrics19,%20207.pdf)

Abstract: References from accounting doctoral course syllabi are used to construct a data base. Some type of syllabus in the areas of financial accounting, research methodology, behavioral accounting, managerial accounting, and information economics and agency theory was obtained from 49 schools. Syllabi references are used to rank accounting departments based on the author’s place of employment and institution from which the doctorate was earned.

? Qiu, L.W. and Tague, J. (1990), Complete or incomplete data sets. The Groos droop investigated. *Scientometrics*, **19** (3-4), 223-237.

Full Text: [1990\Scientometrics19, 223.pdf](1990/Scientometrics19,%20223.pdf)

Abstract: Since the Groos droop of Bradford curves was reported, there has been a controversial explanation of its cause, i.e., that it is caused by an incomplete data set. In this study, a computer simulation was conducted to study the phenomenon. Incompleteness was characterized by two kinds of sampling, weighted and unweighted. Weighted sampling was used to simulate incompleteness of low productivity journals, unweighted sampling incompleteness at all productivity levels. Based on the result of 400 runs (two sampling methods × four sample sizes × ten data sets × fine random runs), the hypothesis that the Groos droop is caused by incomplete data sets was rejected. The relationships between sample size, sampling method and the degree of the droop are also reported.

? Lancaster, F.W., Lee, S.Y.K. and Diluvio, C. (1990), Does place of publication influence citation behavior. *Scientometrics*, **19** (3-4), 239-244.

Full Text: [1990\Scientometrics19, 239.pdf](1990/Scientometrics19,%20239.pdf)

Abstract: Two separate studies have looked at the question of whether or not the sources cited by scientists when they publish in their own national journals differ somewhat from the sources they cite when they publish outside their own country. Data derived from studies of Philippine scientists and Korean mathematicians do suggest that place of publication may exert some influence on citation behavior. In particular, a scientist is more likely to cite national sources when publishing in a national journal than when publishing internationally.

? Konrad, N. and Wahl, D. (1990), Science, technology and development indicators for third-world countries - Possibilities for analysis and grouping. *Scientometrics*, **19** (3-4), 245-270.

Full Text: [1990\Scientometrics19, 245.pdf](1990/Scientometrics19,%20245.pdf)

Abstract: The purpose of this article is to make a distinction between (a) a society’s ability to generate a scientific and technological potential (generativity), (b) the potential itself and (c) the country’s capacity to absorb or receive scientific and technological research results (respectivity). These three complexes are represented by joint indicators covering both levels and structures. A comparison of 30 developing countries (DC) shows, inter alia, that: (a) the polarisation in economic development of the countries considered confirms the view that the future of national development is linked to the scientific and technological potential, (b) joint indicators can interpret better than a comparison of pairs of single indicators, (c) countries with comparable levels of the three capacities (generativity, R & D potential and receptivity) differ mostly in the structures. These structures seem to determine the differences in the use of the capacities, (d) the level of R & D potential is related more closely to the country’s ability to absorb scientific and technological results than with its resources for building up this potential.

? Leydesdorff, L. (1990), Relations among science indicators or more generally among anything one might wish to count about texts. II. The dynamics of science. *Scientometrics*, **19** (3-4), 271-296.

Full Text: [1990\Scientometrics19, 271.pdf](1990/Scientometrics19,%20271.pdf)

Abstract: In a previous paper a static model for the relations among science indicators was discussed. 1 From the perspective of science dynamics, we are interested not in relations among variables or indicators, but in the prediction of an event, given comparable events about which we already have knowledge. The quality of the prediction can be measured by the expected information value I of the message, which converts the a priori probabilities of the events stored in the knowledge base into the a posteriori probabilities of the event. 2 The possibility of predicting in terms of specified variables with hindsight, gives a quantitative measure for testing hypotheses concerning the reconstruction of scientific developments. Some implications for the construction of artificial intelligence using textual archives as a knowledge base will be discussed.

? Leydesdorff, L. (1990), The prediction of science indicators using information-theory. *Scientometrics*, **19** (3-4), 297-324.

Full Text: [1990\Scientometrics19, 297.pdf](1990/Scientometrics19,%20297.pdf)

Abstract: The study discusses the application of various forms of time series analysis to national performance data for EEC countries and the US. First, it is shown that at the aggregated level, a straightforward relation exists between output and input, which varies with time. Various analytical techniques to account for the time factor are discussed. By using information theory, a simple formula can be derived which gives the best prediction for the following year’s data. Subsequently, this model is extended to multivariate forecasting of distributions, Additionally, it can be shown by using this method that in terms of percentage of world share of publications the hypothesis that the EEC develops as a single publication system has to be rejected. However, when co-authorship relations among EEC member countries are used as an indicator, the predominance of a system is suggested.

? Rousseau, R. (1990), Informetrics 87 88 - Egghe, L, Rousseau, R. *Scientometrics*, **19** (3-4), 325-326.

Full Text: [1990\Scientometrics19, 325.pdf](1990/Scientometrics19,%20325.pdf)

? Daniel, H.D. (1990), Introduction: Quantitative science and technology indicators studies in the Federal Republic of Germany. *Scientometrics*, **19** (5-6), 327-329.

Full Text: [1990\Scientometrics19, 327.pdf](1990/Scientometrics19,%20327.pdf)

? Fichtner, D. (1990), Competition in the university system of the Federal Republic of Germany. *Scientometrics*, **19** (5-6), 331-335

Full Text: [1990\Scientometrics19, 331.pdf](1990/Scientometrics19,%20331.pdf)

Abstract: Although the university system in the FRG is largely regulated by the state, the freedom of research, teaching and study guaranteed by the constitution leaves room for competition between the universities. In research, there is competition with institutions outside the universities and with the research departments of large companies. There is also severe competition for the research funds provided by the Federal Government, the Deutsche Forschungsgerneinschaft and German trade and industry. In teaching, research projects are being carried out in order to develop criteria for the measurement of performance. This, together with a system of reporting, will facilitate comparisons and thus encourage competition. The BMBW has contributed to these processes in teaching and research by funding projects on the development of performance criteria and by preparing legislative measures designed to promote competition.

Alewell, K. (1990), Criteria for performance profiles of departments and universities. *Scientometrics*, **19** (5-6), 337-347

Full Text: [1990\Scientometrics19, 337.pdf](1990/Scientometrics19,%20337.pdf)

Abstract: In this paper a proposal is presented on how to meet the increasing demands of the public in Germany for qualified and comparable information about the performance of German universities. Instead of a one-dimensional quantifying ranking-system, a report-system for departments and the university as a whole is presented which contains a list of qualifying statements and comments which are necessary in order to render the quantitative data and ratios comprehensible.

? Daniel, H.D. and Fisch, R. (1990), Research performance evaluation in the German university sector. *Scientometrics*, **19** (5-6), 349-361.

Full Text: [1990\Scientometrics19, 349.pdf](1990/Scientometrics19,%20349.pdf)

? Giese, E. (1990), Rankings of universities in the FRG. *Scientometrics*, **19** (5-6), 363-375.

Full Text: [1990\Scientometrics19, 363.pdf](1990/Scientometrics19,%20363.pdf)

Abstract: The following article examines whether an aggregate comparison (i.e. without discriminating by subject) of university performance in the FRG resulting in a ranking of universities is feasible. First, methods of efficiency measurement are reviewed and possible indicators discussed. In the next part, five indicators are extracted for empirical analysis from a catalogue of ten indicators. Even these have to be used carefully. The last chapter presents results of the analysis. In short, the following conclusions can be drawn: 1. Of the five indicators, none represents a single comprehensive measure of research performance. 2. An aggregate measurement of university research performance, if feasible at all, has to be carried out separately for institutes of technology, universities and comprehensive institutions. 3. Even then, a number of serious statistical problems arise in regard to the methods subsequently applied.

? Rau, E. and Hummel, T. (1990), Rankings of economics departments in the Federal Republic of Germany. *Scientometrics*, **19** (5-6), 377-384.

Full Text: [1990\Scientometrics19, 377.pdf](1990/Scientometrics19,%20377.pdf)

Abstract: The first part of the paper gives a brief account of studies on research productivity in economics departments in the Federal Republic of Germany which were published mainly in the second half of the 1980s. In the second part the results of a recent study on rankings of economics departments at universities in the FRG are presented. The paper claims that ranking studies should include a large variety of performance indicators (quantitative and qualitative) and should always take into account the content and context of research productivity.

? Backesgellner, U. and Sadowski, D. (1990), Organizational implementation of bibliometric indicators. *Scientometrics*, **19** (5-6), 385-395.

Full Text: [1990\Scientometrics19, 385.pdf](1990/Scientometrics19,%20385.pdf)

Abstract: The article deals with the various problems of an implementation of publicatior~ indicators on a departmental level in West-German universities. The German university system relies mostly on social and informal control rneehanisms. Bibliometric indicators can provide adequate information for an effective social control in such a system. However, they will only be accepted and effective if they are valid, thoroughly reliable and robust. A successful adaptation of individual goals and behaviour depends largely on the particular interests and incentives of the faculty members across various departmental arrangements.

? Baumert, J., Naumann, J. and Roeder, P.M. (1990), Reputation - A hard-currency medium of interchange - A structural equation approach. *Scientometrics*, **19** (5-6), 397-408.

Full Text: [1990\Scientometrics19, 397.pdf](1990/Scientometrics19,%20397.pdf)

Abstract: Within the theoretical framework of reputation as a social medium of interchange in the system of higher education this study analyses the institutional stratification of university departments in the field of economics and business administration. In contrast to the still prevailing normative idea of basic equality between academic institutions in the Federal Republic of Germany the empirical results indicate a stable hierarchy of reputation, very similar to the stratification pattern typical of the US American university system. Structural equation models show that the institutional hierarchy can be predicted with considerable accuracy with indicators of scientific activity and impact and structural characteristics of departments and universities. The analyses show both the performance-based validity of institutional reputation and the bias in access to the competitive academic markets due to structural differences of the universities and departments.

? Finkenstaedt, T. (1990), Measuring research performance in the humanities. *Scientometrics*, **19** (5-6), 409-417.

Full Text: [1990\Scientometrics19, 409.pdf](1990/Scientometrics19,%20409.pdf)

Abstract: The article starts from the specific difficulties of applying quantitative analysis to the humanities and the general resistance to such analysis in the Federal Republic of Germany. It gives a survey of the attempts to apply bibliometric methods in English Studies, the only subject investigated so far. The highly individual nature of research in the humanities is stressed and differences in subfields are illustrated. There is little influence of departmental size or age on the publication behaviour of individuals. More studies of citation behavior are needed for a reliable evaluation of the impact of research in the humanities.

? Hartmann, I. and Neidhardt, F. (1990), Peer-review at the Deutsche Forschungsgemeinschaft. *Scientometrics*, **19** (5-6), 419-425.

Full Text: [1990\Scientometrics19, 419.pdf](1990/Scientometrics19,%20419.pdf)

Abstract: Results of a study designed to investigate the peer review system at the Deutsche Forschungsgemeinschaj2 are presented. 242 applications for grants and 639 corresponding reviews were analysed to explore criteria actually used by peers in assessing the quality of proposals. The findings show a wide range of criteria used, an uneven distribution of positive and negative evaluation along these criteria, high inter-referee agreement and different degrees of impact of the evaluations on the overall recommendation.

? Block, H.J. and Krull, W. (1990), What are the consequences? Reflections on the impact of evaluations conducted by a science policy advisory body. *Scientometrics*, **19** (5-6), 427-437.

Full Text: [1990\Scientometrics19, 427.pdf](1990/Scientometrics19,%20427.pdf)

Abstract: This article briefly presents some of the Vftssenschaftsrat’s recent activities which were (and are) particularly designed to exert an influence on the structural development of German universities, Fachhochschulen and research institutes: Evaluations of research institutes, recommendations on structural changes in the higher education system, and statistics concerning the age structure of professors and the employment prospects for young academics. The focal point will be the question: What has been the impact of the reports and recommendations on higher education and research policies?

? Schlieroosen, F. (1990), Quantitative indicators for Federal Government research and technology policy. *Scientometrics*, **19** (5-6), 439-445.

Full Text: [1990\Scientometrics19, 439.pdf](1990/Scientometrics19,%20439.pdf)

Abstract: Five years ago the BMFT implemented a strategy to improve the knowledge of the output aspect of the German R&D system. The inherent objective is to help establish science policy research as an academic discipline and scientometries as one of its methodologies. First results and possible future trends are discussed with respect to the use of scientometrics for policy making.

? Grupp, H. (1990), On the supplementary functions of science and technology indicators - The case of West German telecommunications research and development. *Scientometrics*, **19** (5-6), 447-472.

Full Text: [1990\Scientometrics19, 447.pdf](1990/Scientometrics19,%20447.pdf)

Abstract: Starting from a simple phase model for scientific and technological progress the supplementary functions of various science and technology indicators are discussed. In particular, patent and literature indicators in the field of telecommunications R&D in West Germany are presented and compared. In addition, a few selected technometric, R&D expenditure, and trade data are included for the sake of completeness. This network of science and technology indicators is employed to analyse the institutional set-up and the trends in telecommunications R&D on the macro-level (national level) as well as for single R&D actors (institutional or micro-level). Further, the role of academic and other public R&D in West Germany, including the regional distribution of activities and the specialization with respect to telecommunication subfields, are assessed. It is concluded that the various science and technology indicators - at least in the case of West German telecommunications - supplement each other. Synergisms between indicators do exist and should be explored better in future work. The case of telecommunications is ideal for such an exploratory assessment as it includes basic and applied research as well as strong industrial development activities.

? Faust, K. (1990), Early identification of technological advances on the basis of patent data. *Scientometrics*, **19** (5-6), 473-480.

Full Text: [1990\Scientometrics19, 473.pdf](1990/Scientometrics19,%20473.pdf)

Abstract: The publication of patent applications by the patent offices is the first information available about new technologies. But patent statistics are often distorted due to the exceedingly great number of domestic applications filed in Japan and the delayed publication of patent applications filed in the USA. These distortions can be eliminated to a great extent if only those patent applications are considered for which external applications are also included. Patent indicators allow for a differentiated observation of technological advances before the actual emergence of an innovation. Recent developments in superconductivity provide an example.

? Weingart, P., Sehringer, R. and Winterhager, M. (1990), Which reality do we measure? *Scientometrics*, **19** (5-6), 481-493.

Full Text: [1990\Scientometrics19, 481.pdf](1990/Scientometrics19,%20481.pdf)

Abstract: Scientific reality is a multi-sided phenomenon which cannot be described in a single and authoritative way. The descriptions of scientific research areas differ if one compares the definitions of science policy programmes with expert judgments in the peer-review process. Bibliometric measurements function as an intermediate representation of science. To make them useful and compatible with other representations they have to be translated. The difficulties of mutual translation of these different delineations of scientific research areas are demonstrated in two case studies (marine sciences and multiple sclerosis research) where each of these three different representations of science is supported by empirical results.

? Pfetsch, F.R. (1990), The measurement of a country scientific and technological potential. *Scientometrics*, **19** (5-6), 495-504.

Full Text: [1990\Scientometrics19, 495.pdf](1990/Scientometrics19,%20495.pdf)

Abstract: The paper suggests a formula for the measurement of the national science and technology potential. This is based on a decision-making framework for the development of indicators for the S&T system.

? Spiegel, H.R. (1990), Initiatives for the promotion of science of science: The Stifterverband fur die Deutsche Wissenschaft. *Scientometrics*, **19** (5-6), 505-512.

Full Text: [1990\Scientometrics19, 505.pdf](1990/Scientometrics19,%20505.pdf)

Abstract: As the joint initiative of German trade and industry for the promotion of science, the Stiflerverband is interested in an efficient and transparent system of science and its promotion. This requires knowledge and insights which are provided by scientific research. Hence, research in the field of science of science is always, implicitly or explicitly, the object of the promotional endeavours of the Stiflerverband.

? Braun, T. and Glänzel, W. (1990), United Germany: the New Scientific Superpower? *Scientometrics*, **19** (5-6), 513-521.

Full Text: [1990\Scientometrics19, 513.pdf](1990/Scientometrics19,%20513.pdf)

Abstract: As a consequence of the dramatic upheaval in East-Europe the German reunification has become one of the central problems of nowadays. Several relevant publications have more or less cautiously forecasted the rise of a new superpower in the midst of Europe. The present study attempts to shed light on some quantitative aspects of the research performance in both parts of Germany. Selected citation based indicators are used to determine the initial position and future of the United Germany in scientific research. Though the reunification involves an essential increase of the “scientific potential”, the actual indicator values exhort to rather cautious expectations concerning the immediate intensification of research performance.

Keywords: Germany

? Glänzel, W. (1990), Measurement and support of research performance - German - Fisch, R, Daniel, HD. *Scientometrics*, **19** (5-6), 523-524.

Full Text: [1990\Scientometrics19, 523.pdf](1990/Scientometrics19,%20523.pdf)

? Glänzel, W. (1990), Research evaluation - German - Daniel, HD, Fisch, R. *Scientometrics*, **19** (5-6), 523-524.

Full Text: [1990\Scientometrics19, 523.pdf](1990/Scientometrics19,%20523.pdf)

? Braun, T. (1991), Foreword to the Moravcsik, Michael Memorial Issue. *Scientometrics*, **20** (1), 3-7.

Full Text: [1991\Scientometrics20, 3.pdf](1991/Scientometrics20,%203.pdf)

? Braun, T. and Schubert, A. (1991), The landscape of national performances in the sciences, 1981-1985. *Scientometrics*, **20** (1), 9-17.

Full Text: [1991\Scientometrics20, 9.pdf](1991/Scientometrics20,%209.pdf)

Abstract: Publication and citation indicators of 26 countries in 5 major science fields are presented in the form of three-dimensional “landscapes”. These “landscapes” being an extension of relational charts by adding the dimension of publication size to the expected and observed citation rates, take us one step closer to the ideal of multidimensional assessments so passionately advocated by Moravcsik.

Keywords: Citation, Indicators, Publication, Science, Size, Technology

? Garfield, E. and Small, H. (1991), Michael J. Moravcsik: Multidimensional scholar and hero of third world science. *Scientometrics*, **20** (1), 19-24.

Full Text: [1991\Scientometrics20, 19.pdf](1991/Scientometrics20,%2019.pdf)

Keywords: Citations, Countries, Crisis, Methodology, Particle Physics, Quality, Technology

? Snizek, W.E., Oehler, K. and Mullins, N.C. (1991), Textual and nontextual characteristics of scientific papers - neglected science indicators. *Scientometrics*, **20** (1), 25-35.

Full Text: [1991\Scientometrics20, 25.pdf](1991/Scientometrics20,%2025.pdf)

Abstract: The citation rates of scientific papers, long used by numerous sociologists of science to measure the influence of individual scientists and the diffusion of knowledge, are shown to be partly affected by the various structural characteristics of these papers. Based on an analysis of 221 scientific papers in three cocitation clusters, between 15 and 35 percent of the variation in citation rates is found to be a function of those papers’ textual and nontextual characteristics. The citation rates of papers in the Burkitts-Lymphoma and Heavy Quark Potential clusters are shown to be heavily dependent on abstract characteristics such as readability and number of uncommon words. The citation rates of DNA cluster papers are observed to be significantly affected by both the number of references and figures found in the body of those papers. Of particular note is the fact that while the readability of abstracts is shown to decrease the citation rates of Burkitts-Lymphoma papers, the opposite is true of Heavy Quark Potential papers.

Keywords: Analysis, Citation, Cocitation, Diffusion, DNA, Function, Information, Knowledge, Papers, Physics, Science

Beck, M.T. and Gáspár, V. (1991), Scientometric evaluation of the scientific performance at the faculty of natural sciences, Kossuth Lajos University, Debrecen, Hungary. *Scientometrics*, **20** (1), 37-54.

Full Text: [1991\Scientometrics20, 37.pdf](1991/Scientometrics20,%2037.pdf)

Abstract: The standard of research at different departments of the Faculty of Natural Sciences of Kossuth Lajos University has been assessed by a scientometric evaluation of the publication activities of the departments. The essence of our approach is the consideration of the number and quality of the papers published. For a measure of this quality we regarded the impact factor of the journal, in which a paper was published. The rather different range of the impact factors of different fields were taken into account during the evaluation. As a whole, no considerable difference was found between the publication activity (impact per number of researchers) of the research institutes of the Hungarian Academy of Sciences and the corresponding departments of our Faculty, although, significant differences occur in certain fields. Based on this study, changes in the publication strategies of the different departments were recommended.

Keywords: Changes, Evaluation, Hungary, Impact Factor, Impact Factors, Journal, Papers, Publication, Publication Activity, Quality, Research, Scientometric, Standard

Abdullah, S.B. and Lancaster, F.W. (1991), The contribution of scientists to the popular literature, their role as expert witnesses, and their influence on their peers: A case study in the field of acid rain. *Scientometrics*, **20** (1), 55-64.

Full Text: [1991\Scientometrics20, 55.pdf](1991/Scientometrics20,%2055.pdf)

Abstract: Using the field of acid rain research as a case study, it was found that scientists who contribute to the popular literature are more likely than others to be called on to give Congressional testimony (and vice versa) and that the work of these same scientists is well recognized by their peers as judged by rates of citation. Indeed, scientists who contribute to the popular literature are more highly cited than those who do not whether or not they are called upon for expert testimony. Since those who give testimony are more highly cited than those who do not, some evidence also exists that scientists called before Congressional hearings are among those most influential in the science community.

Keywords: Case Study, Citation, Community, Evidence, Expert Testimony, Literature, Research, Science, Testimony, Work

? Nalimov, V.V. (1991), Meeting the Xxith century. *Scientometrics*, **20** (1), 65-69.

Full Text: [1991\Scientometrics20, 65.pdf](1991/Scientometrics20,%2065.pdf)

? Trimble, V. (1991), Long-term careers of astronomers with doctoral degrees from prestigious vs non-prestigious universities. *Scientometrics*, **20** (1), 71-77.

Full Text: [1991\Scientometrics20, 71.pdf](1991/Scientometrics20,%2071.pdf)

Abstract: A comparison has been made of the long-term careers of complete samples of astronomers who earned their PhD’s at one prestigious (P) and one nonprestigious (NP) university. The sample sizes are 106 (degrees 1952-88) and 94 (degrees 1966-88) respectively. For both groups, the vast majority are still engaged in some aspect of astronomy or closely related sciences (90% and 74% respectively). But the fraction still engaged primarily in astronomical research and advanced teaching at PhD-granting universities and observatories is 65% for the prestigious and only 32% for the non-prestigious institution. The half-lives as members of the research publishing community are more than 30 yr vs. less than 20 yr for P vs. NP astronomers. Very little of the difference is attributable to the different distributions of dates of degrees in the two samples. A subsample of the P astronomers age-matched to the NP ones has 66% still engaged is astronomical research and advanced teaching, a large difference in publishing half-lives also persists in the subsamples with degrees since 1966.

Keywords: Careers, Community, Comparison, Publishing, Research, Sciences, Teaching, Universities, University

? Qurashi, M.M. (1991), Publication-rate and size of two prolific research groups in Departments of Inorganic-Chemistry at Dacca University (1944-1965) and Zoology at Karachi University (1966-84). *Scientometrics*, **20** (1), 79-92.

Full Text: [1991\Scientometrics20, 79.pdf](1991/Scientometrics20,%2079.pdf)

Abstract: There has been considerable interest in studying how the research output of a group of N researchers depends on the group-size, N. Several workers have studied this, but with conflicting conclusions, ranging from finding constant per-capita output to per-capita output varying linearly as N, and even exponentially with N. The present communication states afresh the author’s earlier theory of productive interactions and gives analyses of the outputs of two prolific research groups: one from Dhaka University, Bangladesh, and one from Karachi University, Pakistan, each over nearly two decades. The data, obtained from published bibliographies, are sub-divided into small successive ranges of lab. group size, 1-2, 3-4, 5-6, etc., and analyzed by calculating the relevant publication-rate per person (R) for each range. Plots of the data from each group show evidence of an initial approx. linear rise of per-capita publication rate, R, up to about N = 5, followed by a maximum at group-size of 6 to 8 persons. This group size would correspond to the optimum efficiency, as a balance between the benefits of increasing interaction (alpha-N2) and Parkinsonian loss of efficiency. This is in agreement with the first peak in the author’s earlier analysis (of recent U.K. and U.S.A. data) published five years ago in Scientometrics, as well as his previous work published elsewhere. Possible reasons for the failure of statistical criteria to show up this phenomenon of increasing per-capita output are indicated and further indepth studies on two University research groups are planned.

Keywords: Analysis, Bangladesh, Bibliographies, Communication, Criteria, Efficiency, Evidence, First, Interaction, Pakistan, Person, Publication, Research, Scientometrics, Size, Small, Theory, Work

? Egghe, L. (1991), The exact place of Zipfs and Paretos law amongst the classical informetric laws. *Scientometrics*, **20** (1), 93-106.

Full Text: [1991\Scientometrics20, 93.pdf](1991/Scientometrics20,%2093.pdf)

Abstract: In this paper, the special place of Zipf’s law and Pareto’s law amongst other classical informetric laws (such as Bradford’s graphical and verbal law, Weber-Fechner’s or Brookes’, Leimkuhler’s and Mandelbrot’s) is revealed and explained. Equivalencies amongst some of these laws are proved. We also determine the conditions under which Bradford’s graphical law is a special case of Bradford’s verbal law.

Keywords: Law, Laws, Zipf’s Law

? Bonitz, M. (1991), The impact of behavioral principles on the design of the system of scientific communication. *Scientometrics*, **20** (1), 107-111.

Full Text: [1991\Scientometrics20, 107.pdf](1991/Scientometrics20,%20107.pdf)

Abstract: This paper 1 provides further evidence for the validity of the holography and maximum speed principles. Supportive examples stem from an attempt to measure speed indicators in scientific communication processes directly, from a new scientific communication channel launched by the Institute for Scientific Information, Philadelphia, USA, from a search for correlations between scientometric indicators and socio-economic indicators, and from a study of rank distribution phenomena occurring in the transition from individual to collective parameters for ranking of scientific journals. Examples of this kind increase the reliability of the behavioral principles when these are imposed on the design, performance and use of both the formal and informal channels of the system of scientific communication.

Keywords: Communication, Correlations, Evidence, Indicators, Institute for Scientific Information, Journals, Principles, Ranking, Reliability, Scientific Communication, Scientific Journals, Scientometric, USA, Validity

? Meadows, A.J. (1991), Quantitative Study of Factors Affecting the Selection and Presentation of Scientific Material to the General Public. *Scientometrics*, **20** (1), 113-119.

Full Text: [1991\Scientometrics20, 113.pdf](1991/Scientometrics20,%20113.pdf)

Abstract: The science-related material published in newspapers can be analysed to provide insight into the biases and techniques involved in transferring knowledge from the science community to the general public. A part of such studies can be carried out in quantitative terms. Three such quantitative approaches are illustrated here: (1) measurement of space devoted to science, (2) derivation of readability indices, (3) content analysis.

Keywords: Analysis, Community, Knowledge, Measurement, Science, Techniques

? Peritz, B.C. (1991), The citation impact of letters to the editor - The case of Lancet. *Scientometrics*, **20** (1), 121-129.

Full Text: [1991\Scientometrics20, 121.pdf](1991/Scientometrics20,%20121.pdf)

Abstract: Letters to the editor published in the Lancet during the first half of 1980 were less cited than the corresponding papers. The average number of citations per letter was larger if the letter contained some substantive information. The longer the letter the more frequently it was cited. Letters that react to some previous publication tend to be shorter than “spontaneous” letters. “Reacting” letters tend to be less cited than spontaneous letters if they are short, more cited if they are longer. Letters with substantive information tend to originate outside the UK in which case they are also more cited.

Keywords: British Science, Citations, Decline, First, Information, Journals, Papers, Publication, UK

? Pravdic, N. and Oluić-Vuković, V. (1991), Distribution of scientific productivity: Ambiguities in the assignment of author rank. *Scientometrics*, **20** (1), 131-144.

Full Text: [1991\Scientometrics20, 131.pdf](1991/Scientometrics20,%20131.pdf)

Abstract: Methodological implications of four accounting procedures applied in multiple authorship treatment relating to author productivity distribution were investigated. The emphasis was given to the individual author rank and inequality pattern of data. It was found that similar pattern of inequality holds in three of the four analysed cases, in spite of the fact that significant changes were observed on the individual level. By introducing the concept of dual approach a plausible interpretation of that phenomenon was obtained.

Keywords: Author Productivity, Authorship, Bradford, Changes, Inequality, Lotka Law, Multiple Authorship, Procedures, Science, Treatment

Vinkler, P. (1991), Possible causes of differences in information impact of journals from different subfields. *Scientometrics*, **20** (1), 145-161.

Full Text: [1991\Scientometrics20, 145.pdf](1991/Scientometrics20,%20145.pdf)

Abstract: Differences in size, mean number of references per paper in journals, ageing of information and disciplinarity of some subfields in chemistry were studied in order to explain different average impact factors for journals. A new indicator - Standard Journal Impact - is suggested, which may be used as a standardized (i.e. comparable) impact indicator for journals in different subfields. The main reason for the lower impact factor for journals of the macromolecular chemistry subfield may be the lower extent of the application of their results by other subfields

Keywords: Ageing, Bibliometric Indicators, Chemistry, Citation, Impact Factor, Impact Factors, Indicator, Information, Journals, Size

? Todorov, R. and Winterhager, M. (1991), An overview of Moravcsik, Mike publication activity in physics. *Scientometrics*, **20** (1), 163-172.

Full Text: [1991\Scientometrics20, 163.pdf](1991/Scientometrics20,%20163.pdf)

Abstract: A bibliometric online technique is applied on data from the INSPEC bibliographic file to describe some aspects of Moravcsik’s publication activity (co-authorship, source journals, etc.). Separately, a co-occurrence method is used to represent the subject structure (the main topics and their links) of his papers in physics. The principle underlying this method is to develop a network based on common appearances of classification subdivisions (headings) as well as of controlled terms in Moravcsik’s document records. The results, in the form of line and point graphs, give a global picture of Mike Moravcsik’s research profile in physics.

Keywords: Bibliometric, Classification, Co-Authorship, Coauthorship, Journals, Network, Papers, Publication, Publication Activity, Records, Research, Science, Structure

Archibald, G. and Line, M.B. (1991), The size and growth of serial literature 1950-1987, in terms of the number of articles per serial. *Scientometrics*, **20** (1), 173-196.

Full Text: [1991\Scientometrics20, 173.pdf](1991/Scientometrics20,%20173.pdf)

Abstract: It is commonly stated and believed that scholarly and scientific journal literature is growing exponentially. To obtain a truer picture of the situation, a study was made of a sample of 190 journals that started life in or before 1950, 20 in each of 9 subject fields, plus 10 extra in literature. The number of articles in each journal in 1950, 1960, 1970, 1980 and 1987 was counted. The analysis showed a rapid growth in most subjects up to 1970, a much slower growth between 1976 and 1980, and a slow growth or decline between 1980 and 1987, the fields of decline included general and physical science and technology. The total number of journals is still increasing, but the rate of growth has dropped dramatically over the last ten years. Although it is possible that more recently established journals would show a different pattern, it seems likely that the overall rate of growth of the total number of journal articles is slow.

Keywords: Analysis, Growth, Journal, Journal Articles, Journals, Life, Literature, Science, Science and Technology, Technology

Singh, U.N. and Arunachalam, S. (1991), Publication and citation patterns in the literature of liquid crystals with special reference to the contribution of India, Canada, Japan, United Kingdom and the Soviet Union. *Scientometrics*, **20** (1), 197-220.

Full Text: [1991\Scientometrics20, 197.pdf](1991/Scientometrics20,%20197.pdf)

Abstract: From an analysis of bibliographic data on 430 journal articles on liquid crystals covered in Physics Abstracts 1976 and the 4729 citations to them up to the end of 1987, we have identified the geographic origin, the prominent institutions, language and journal-wise distribution of the papers, the citedness of these papers, and the distribution of citations as a time series for the highly cited papers. We have also analysed the 126 papers published by authors from India, Canada, Australia, Israel, Japan and the United Kingdom and covered in Physics Abstracts 1978, and the 1154 citations to them up to 1987. Unlike in most other high tech areas of physics, in LC research the difference in performance between the USA and the other leading countries is not very pronounced. Publication data from 1976, 1978 and 1985 reveal that LC literature is on the rise and that the percentage share of the Soviet Union is rising fast and that of the USA is on the decline

Keywords: Analysis, Australia, Bibliometric Analysis, Canada, Citations, Countries, India, Institutions, Israel, Japan, Journal, Journal Articles, Journals, Liquid Crystals, Literature, Origin, Papers, Research, Science, Superconductivity, United Kingdom, USA

? Lindsey, D. (1991), The relationship between performance indicators for academic research and funding - Developing a measure of return on investment in science. *Scientometrics*, **20** (1), 221-234.

Full Text: [1991\Scientometrics20, 221.pdf](1991/Scientometrics20,%20221.pdf)

Abstract: Public universities reflect the aspirations a state or society has for its young people and for itself. In this study our interest has been to examine the level of public funding for universities and its relation to quality. In order to do this we collected funding data for a sample American universities. Additionally, we collected data on the production of science by faculty at the institutions in our American sample. The results indicated a strong relation between investment in higher education and quality. We then developed a measure of return on investment in research which combined these measures of funding and research production. We conclude by examining the nature of the relationship between funding and research quality at public universities.

Keywords: Education, Faculty, Higher Education, Institutions, Quality, Research, Research Quality, Science, Society, Universities

? Peters, H.P.F. and Van Raan, A.F.J. (1991), Structuring scientific activities by co-author analysis: An exercise on a university faculty level. *Scientometrics*, **20** (1), 235-255.

Full Text: [1991\Scientometrics20, 235.pdf](1991/Scientometrics20,%20235.pdf)

Abstract: In this paper we apply ‘co-author analysis’ to create from a large set of publications clusters of collaborating researchers within a faculty of chemical engineering. Results have been discussed with an expert. The co-author clusters appeared to be meaningful, with respect to the identification of research groups, the relations within these groups, as well as to relations between these groups and changes in time. Also differences between ISI-based and non-ISI based maps proved to be consistent with the expert’s opinion. Many clusters represent collaborating authors grouped around a full professor, mostly the department chairman. Co-author analysis can be used, for example, as an important tool in evaluative bibliometrics in order to make a first identification of research groups in ‘unknown’ universities or organizations.

Keywords: Analysis, Bibliometrics, Changes, Disciplinary, Faculty, First, Identification, Publications, Relations, Research, Science, Universities

? Pao, M.L. (1991), On the relationship of funding and research publications. *Scientometrics*, **20** (1), 257-281.

Full Text: [1991\Scientometrics20, 257.pdf](1991/Scientometrics20,%20257.pdf)

Abstract: The impact of a 17 year period of funding in schistosomiasis research on publication outcome was examined. Two productivity and three quality indicators were used to compare the output from the entire population of schistosomiasis in this period with those associated with 351 funded researchers. A substantially higher productivity and citation impact were found. This consistency of direction points to the positive effect of a period of sustained funding commitment.

Keywords: Assessing Basic Research, Citation, Commitment, Countries, Impact, Indicators, NIH, Output, Population, Publication, Quality, Research, Research Performance, Science, System

? Eto, H. (1991), Science revolution and ortega hypothesis in developing-countries. *Scientometrics*, **20** (1), 283-295.

Full Text: [1991\Scientometrics20, 283.pdf](1991/Scientometrics20,%20283.pdf)

Abstract: The science revolution, the “paradigm” change and the Ortega hypothesis on the role of average scientists are discussed in the context of catchup of developing countries. The relative weight of scientific fields is compared between countries as revealing their values on science. Finding some significant difference between countries, the role of developing countries is discussed in view of a possible science revolution, the “paradigm” change and the Ortega hypothesis.

Keywords: Big Science, Science, World

Sengupta, I.N. and Kumari, L. (1991), Bibliometric analysis of AIDS literature. *Scientometrics*, **20** (1), 297-316.

Full Text: [1991\Scientometrics20, 297.pdf](1991/Scientometrics20,%20297.pdf)

Abstract: In accordance with high incidence of AIDS cases, there is an epidemic growth of its literature. This unprecedented growth of literature calls for serious scientometric study. Such a study will not only help the scientometrists, information scientists, but also will be very useful to the related research workers. With this in view an attempt has been made to analyse AIDS literature published during the period 1976-1986 to identify its international channel of communication, medium of communication, contributing countries, authorship trends etc. This study is based on data printed in a source document entitled Collected Papers on AIDS Research, 1976-1986 published by BIOSIS which is retrospective bibliography incorporating valuable references to research on AIDS from 9,000 source titles monitored in BIOSIS data base. The findings of this study have also been compared to those of Wyatt and Self, Filardo and Lancaster.

Keywords: AID, AIDS, Authorship, Communication, Data Base, Deficiency Syndrome AIDS, Epidemic, Growth, Incidence, Information, International, Literature, Research, Scientometric, Trends

? Schubert, A. and Glänzel, W. (1991), Publication dynamics - Models and indicators. *Scientometrics*, **20** (1), 317-331.

Full Text: [1991\Scientometrics20, 317.pdf](1991/Scientometrics20,%20317.pdf)

Abstract: Models and indicators characterizing the dynamics of national publication productivity distributions are presented. The indicator triplet: transience, renewal, and dynamism is used to describe the “physical shape” of a national scientific community.

Keywords: Community, Dynamics, Indicator, Indicators, Publication, World

Martin, B.R. (1991), The bibliometric assessment of UK scientific performance: A reply to Braun, Glánzel and Schubert. *Scientometrics*, **20** (2), 333-357.

Full Text: [1991\Scientometrics20, 333.pdf](1991/Scientometrics20,%20333.pdf)

Abstract: In 1987, an analysis of the CHI, NSF Science Literature Indicators Data-Base by the author and his colleagues suggested that the UK’s percentage share of the world publication and citation totals had continued to fall over 1981-84, although at a slower rate than previously. That finding has recently been challenged by Braun, Glänzel and Schubert who, by combining 28 publication-based indicators, concluded that there was no statistically significant evidence for such a decline. This paper examines the reasons for the discrepancy. It is argued that the methodology of Braun et al. is seriously flawed, as well as being inconsistent with work that they have published elsewhere. By adopting a more consistent and realistic set of indicators and applying them to the data of Braun et al., one arrives at results entirely consistent with those derived from the CHI, NSF data-base.

Keywords: Analysis, Basic Research, British Science, Citation, Data Base, Database, Decline, Evidence, Indicators, Methodology, National Performance, Publication, Science Citation Index, Work

Braun, T., Glänzel, W. and Schubert, A. (1991), The bibliometric assessment of UK scientific performance: Some comments on martin’s ‘reply’. *Scientometrics*, **20** (2), 359-362.

Full Text: [1991\Scientometrics20, 359.pdf](1991/Scientometrics20,%20359.pdf)

Abstract: No new arguments or evidence that undermine our conviction that available scientometric measures do not indicate a statistically significant ‘decline’ of British science in the first half of the eighties have been found in Martin’s reply.

Keywords: Evidence, First, Science, Scientometric

Leydesdorff, L. (1991), On the ‘scientometric decline’ of British Science: One additional graph in reply to Ben Martin. *Scientometrics*, **20** (2), 363-367.

Full Text: [1991\Scientometrics20, 363.pdf](1991/Scientometrics20,%20363.pdf)

Abstract: With respect to the issue of whether the scientometric measurement of ‘the decline of British science’ is an artifact of the specific database and underlying assumptions in methods, I argue that there are fewer analytical objections against measurement by using SciSearch Online than against other methods (based on the ‘fixed journal set’ and ‘fractional counting’). The measurement of ‘international co-authorship’, i.e. a network indicator, should not be confounded with measurement of performance of a single nation. The time series for the different subsets of UK-publications, which have been proposed, are given. None of the indicators can be shown to exhibit a trend (in contrast to a drift). The hypothesis of a decline has therefore to be rejected.

Keywords: Assumptions, Database, Indicator, Indicators, Journal, Measurement, Methods, Network, Scientometric

Kealey, T. (1991), Government-Funded Academic Science is a consumer good, not A producer good: A comparative reassessment of Britain’s Scientific and Technological Achievements since 1794 and a comment on the bibliometry of B. Martin and J. Irvine. *Scientometrics*, **20** (2), 369-394.

Full Text: [1991\Scientometrics20, 369.pdf](1991/Scientometrics20,%20369.pdf)

Abstract: Martin and Irvine believe that their bibliometric data indicates that British science is in decline. This paper shows that, in fact, their data points to a considerable expansion in British science. To account for different countries’ scientific performance, this paper generates simple predictive formulae that correlate Gross National Product with research output.

Keywords: Bibliometric, Britain, British Science, Decline, Facts, Figures, Research, Science

? Cohen, J.E. (1991), Size, age and productivity of scientific and technical research groups. *Scientometrics*, **20** (3), 395-416.

Full Text: [1991\Scientometrics20, 395.pdf](1991/Scientometrics20,%20395.pdf)

Abstract: Varied empirical studies show that the average output (measured in various ways) of a scientific or technical research group is directly proportional to its size (also measured in various ways), when the size and output are measured independently. Hence groups of different sizes have the same average output per unit of size. There is no reliable evidence for the existence of a size or a range of sizes for a research group that maximizes output per unit of size. Present theoretical explanations for the proportionality between size and output are largely inadequate or untested. Similarly, among reported results on group age and output, the only consistency so far is that age, measured as years since the founding or first functioning of the group, is uncorrelated with output per capita. Again, there is no evidence for the existence of an age or a range of ages for a research group that is optimal.

Keywords: Evidence, First, Laboratory Size, Physics, Publication Rate, Research, Science, Size

? Logan, E.L. and Shaw, W.M., Jr. (1991), A bibliometric analysis of collaboration in a medical specialty. *Scientometrics*, **20** (3), 417-426.

Full Text: [1991\Scientometrics20, 417.pdf](1991/Scientometrics20,%20417.pdf)

Abstract: Investigating the relationships found in the documentation of a subject field is one method of examining the communication taking place in the field. Bibliometrics provides an objective method for this type of investigation. Coauthorship, while intuitively seeming to indicate strong communication links, nevertheless has been shown to produce graphical structures that vary with changes in threshold. Having determined that clustering structure does exist in the data, preferred partitions are identified as those least likely to have occurred by chance. Further analysis is made to test that the preferred or ‘meaningful’ structures produced from the coauthor relationship do indeed correspond with empirical evidence of ‘meaning’. A small dataset of 371 authors and 550 coauthor pairs is used to investigate correspondence between experimental structures and empirical evidence. Results show that components of the experimental structures are largely consistent with subject content groups as determined by index terms. Geographic focus accounts for about half the cases showing term overlap. Hence, we have some evidence that bibliometric structures determined from the coauthor relationship may be consistent with networks of communication. If this continues to be documented by further research, bibliometric analysis of coauthor relationships found in the scholarly communication of a subject area can become a basic tool for communication research.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometrics, Changes, Clustering, Communication, Documentation, Evidence, Experimental, Graph, Investigation, Research, Scholarly Communication, Small, Structure

? Richards, J.M. (1991), Years cited - An alternative measure of scientific accomplishment. *Scientometrics*, **20** (3), 427-438.

Full Text: [1991\Scientometrics20, 427.pdf](1991/Scientometrics20,%20427.pdf)

Abstract: Citation counts often are used to measure scientific accomplishment. It is very difficult, however, to compute accurate citation counts in research where one has a list of scientists but not their complete bibliographies. At the same time, procedures are available that permit informed judgments about whether given scientists were cited at all in given years. The possibility of such judgments suggested that the number of years in which scientists were cited might be used as an alternative measure of scientific accomplishment. This possibility was explored in two studies, one based on 2,713 population scientists and the other on 135 articles published in the journal Fertility and Sterility. Years cited was easy to compute, and had good descriptive statistics, satisfactory generalizability coefficients, high correlations with total citation counts, and distributions little influenced by outliers. These results supported the appropriateness of the years cited measure.

Keywords: Alternative, Bibliographies, Citation, Citation Counts, Correlations, Eminence, Journal, Population, Procedures, Psychology, Research, Science, Statistics

? Vanraan, A.F.J. (1991), Fractal geometry of information space as represented by co-citation-clustering. *Scientometrics*, **20** (3), 439-449.

Full Text: [1991\Scientometrics20, 439.pdf](1991/Scientometrics20,%20439.pdf)

Abstract: In this paper we discuss geometrical properties of ‘information space’ as represented by the phenomenon of co-citation clustering. More specifically, the size distribution of co-citation clusters is studied and interpreted in terms of fractal dimensions.

Keywords: Clustering, Co-Citation, Cocitation, Fractal, Information, Science, Size

? Schubert, A. (1991), Quantitative studies of science a current bibliography No. 17. *Scientometrics*, **20** (3), 451-458

Full Text: [1991\Scientometrics20, 451.pdf](1991/Scientometrics20,%20451.pdf)

? Yitzhaki, M. and Bentamar, D. (1991), Number of references in biochemistry and other fields - A case-study of the journal of biological chemistry throughout 1910 - 1985. *Scientometrics*, **21** (1), 3-22.

Full Text: [1991\Scientometrics21, 3.pdf](1991/Scientometrics21,%203.pdf)

Abstract: Large samples of papers published in the Journal of Biological Chemistry in all decades and in some mid-decades were checked in order to study the referencing pattern, throughout the period 1910-1985, in an internationally leading journal, with especially high “citation impact”. All measures show that there has been a significant growth in the number of references per paper, during most of the period, but mainly from the 1950’s on, refuting Meadows’ “upper limit”. A detailed comparison to a wide range of fields shows the JBC rates to be among the highest. Eight factors affecting the number of references are discussed, and some projections for the future are made.

Keywords: Citation Analysis, Comparison, Growth, Impact, Journal, Literatures, Papers, Referencing, Social-Sciences

? Pouris, A. (1991), Identifying areas of strength in South-African technology. *Scientometrics*, **21** (1), 23-35.

Full Text: [1991\Scientometrics21, 23.pdf](1991/Scientometrics21,%2023.pdf)

Abstract: This article is an attempt to identify the strengths and weakness of South African technology as they are manifested in patent analysis. Using the “Technological Activity and Impact Indicators Database” of CHI Research/Computer Horizons, Inc., we identified the South African Innovation profile for the period 1975-1988. Patents are analysed in their aggregate form in patent classes, Standard Industrial Classes and technologically similar classes. The result indicates a shift of activity from low medium technology fields and a weakness in high technology fields. Comparison of scientific and technological activity also reveals that South Africa contributes five times as much in international science than it does in technology. Detailed analyses indicate the rise of a defence related industry in the country and reveal areas of emphasis and neglect.

Keywords: Analysis, Indicators, International, Neglect, Patent, Patent Analysis, Science, South Africa, Technological Activity, Technology

? Bridgstock, M. (1991), The quality of single and multiple authored papers - An unresolved problem. *Scientometrics*, **21** (1), 37-48.

Full Text: [1991\Scientometrics21, 37.pdf](1991/Scientometrics21,%2037.pdf)

Abstract: Evidence is examined for the repeated claim that published papers with more than one author are, on average, of higher quality than those with a single author. Among published studies it is shown that no clear conclusion can be drawn, though evidence supporting the claim is stronger in astronomy and physics than among the social sciences. An empirical study of 656 papers in four Australian science journals produced negative results. Possible reasons for the differing results, and difficulties in researching the field, are highlighted.

Keywords: Citations, Evidence, Journals, Papers, Physics, Productivity, Publication, Quality, Science, Science Journals, Sciences, Scientific Collaboration, Social Sciences, Trends

? Sikorav, J.L. (1991), The utility of scientific papers. *Scientometrics*, **21** (1), 49-68.

Full Text: [1991\Scientometrics21, 49.pdf](1991/Scientometrics21,%2049.pdf)

Abstract: This article investigates the function of scientific papers in the production of scientific knowledge. For this production, the citations made of these papers in the scientific literature can be considered as economic utilities. The work of the scientist is described as the production of citations by means of citations. The number of citations received by a given paper can be used to measure the paper’s formal utility. The formal utility of scientific papers is studied empirically. It is concluded that the references contained in a scientific paper are a major determinant of its future utility.

Keywords: Articles, Basic Research, Citation Analysis, Citations, Economics, Function, Information, Knowledge, Literature, Obsolescence, Papers, Progress, Utility, Work

? Lemarc, M., Courtial, J.P., Senkovska, E.D., Petard, J.P. and Py, Y. (1991), The dynamics of research in the psychology of work from 1973 to 1987 - from the study of companies to the study of professions. *Scientometrics*, **21** (1), 69-86.

Full Text: [1991\Scientometrics21, 69.pdf](1991/Scientometrics21,%2069.pdf)

Abstract: We use a co-word analysis of the key words of 6055 articles that appeared in the psychology of work from 1973 to 1987 and were listed in the PASCAL database to bring out changes in the scientific themes of the field. We can discern which themes remained significant and which disappeared, as well as the psychology of work’s borrowings from and contributions to other disciplines. Co-word analysis therefore constitutes a new tool in the science policy arena.

Keywords: Analysis, Changes, Database, Policy, Psychology, Science, Science Policy, Work

? Budd, J. and Hurt, C.D. (1991), Superstring theory - Information-transfer in an emerging field. *Scientometrics*, **21** (1), 87-98.

Full Text: [1991\Scientometrics21, 87.pdf](1991/Scientometrics21,%2087.pdf)

Abstract: This paper traced an individual paper through the literature as it garnered citations. This paper was chosen because of its seminal nature in a highly controversial area of theoretical physics. The distribution of citations was tested against models suggested by Price and Kuhn as well as compared to other studies which also examined benchmark papers. The results indicate that the paper chosen behaved in a significantly different way from most of the prior models. The suggestion is made that further study of this and papers like it will add much to the theory of information transfer in science.

Keywords: Citations, Information, Literature, Models, Papers, Science, Theory

? Markusova, V.A. and Griffith, B.C. (1991), Highly cited Soviet journals in the physical and life sciences - A study of the function of journals. *Scientometrics*, **21** (1), 99-113.

Full Text: [1991\Scientometrics21, 99.pdf](1991/Scientometrics21,%2099.pdf)

Abstract: The research developed from the identification of the most highly cited Soviet journals in the physical and life sciences. Several measures of growth and citedness were taken at the beginning and end of a recent five-year period, 1982-87, in order to generally assess the functions of these journals. The research involved making comparisons among these groupings of journals and control groupings of journals with similar content, but not published in the Soviet Union. Differences in citedness could be related, in the physical sciences, to the scale of Russophone science within world sciences, but not in the life sciences. In the physical sciences, there are increases in the citedness across Soviet and Western journals, but in the Soviet journals the increase is several times greater than in the control grouping. In sharp contrast, the largest, most cited, Western life sciences’ journals have increased in citedness and other groupings, including Soviet journals, have declined. The measures on control groups show that the extreme levels of improvement in citedness on the part of Soviet physical sciences’ journals reflect local, i.e. Soviet, developments. The decrease in citedness of Soviet life sciences’ journals seems, instead, tied broadly to events in the world life sciences’ literature. There has been, apparently a “centralizing” of attention within those discipline on those few journals publishing major findings while leaving the rest of the world literature behind. In addition, the research developed several findings on the formal properties of the measures used.

Keywords: Control Groups, Functions, Growth, Identification, Journals, Life, Life Sciences, Literature, Physical Sciences, Publishing, Research, Science, Sciences

? Cesaratto, S., Mangano, S. and Sirilli, G. (1991), The innovative behavior of italian firms - A survey on technological innovation and research-and-development. *Scientometrics*, **21** (1), 115-141.

Full Text: [1991\Scientometrics21, 115.pdf](1991/Scientometrics21,%20115.pdf)

Abstract: This paper is based on the findings of a survey on technological innovation in the Italian industry. All Italian manufacturing firms were screened in the analysis and, at the end of a screening process, 8,220 of them, which had introduced relevant technological innovations over the period 1981-1985, filled out either a mail questionnaire or were covered through a personal interview. Data and preliminary comments on the following problem-areas are set in the paper type of innovation introduced in the firm (product, process), impact of innovations on the firm’s products and sales, cost of innovation, technological relevance of innovations introduced, impact of innovations on the utilization of input factors, factors linked to the introduction of innovation, performance of R & D. Data show that technological innovation is a complex aspect of company life, it relates to both products and production processes: in more than half of the cases firms introduced both product and process innovations, whereas only products or processes were introduced in about 20 per cent of cases, respectively. It is also apparent that the majority of innovations are new only for the firm, and that only a limited share are new for the sector or for the country. Looking at the techno-scientific “quality” of the innovations introduced, quite often innovations were classified as technical improvements or enhancements, and in a very limited number of cases they were considered as applications of a scientific breakthrough. The breakdown of the innovation costs shows that, on average, more than half of the cost is attributed to investment (machinery, equipment, etc) one fourth to engineering and design activity, one fifth to R & D and the remaining 5 per cent to marketing activities. The most important factor linked to the introduction of innovation appears to be the acquisition of plant and machinery. This confirms the result of previous analyses which show that the introduction of new technologies hinges upon new machinery and equipment, often the sole means for the acquisition of technology produced by other economic agents - a diffusion and adaptation process is occurring. R & D was mentioned in a limited number of cases. In the paper a quantitative and qualitative analysis of the R & D performed by the firm is reported. In particular, it is shown that the number of R & D performing manufacturing firms is more than double that which emerges from the annual survey on research and development activities carried out by the Italian Central Statistical Office.

Keywords: Adaptation, Analysis, Breakthrough, Cost, Costs, Development, Diffusion, Equipment, Innovation, Life, Marketing, Plant, Qualitative, Qualitative Analysis, Questionnaire, Relevance, Research, Research And Development, Screening, Sector, Survey, Technological Innovation, Technologies, Technology, Utilization

Vinkler, P. (1991), Magic triangle for three relative impact indicators. *Scientometrics*, **21** (1), 143-146.

Full Text: [1991\Scientometrics21, 143.pdf](1991/Scientometrics21,%20143.pdf)

Abstract: Simple relations were found between Relative Citation Rate (RCR), Relative Subfield Citedness (R(w)) and Subfield Publication Strategy (P(s)) indicators. The R(w) indicator is supposed to be more characteristic of the international scientific impact of papers than RCR using mean citation rate of journals representing the respective subfield, as standard.

Keywords: Citation, Indicator, Indicators, International, Journals, Papers, Relations, Standard

? Garg, K.C. and Sharma, P. (1991), Solar power research - A scientometric study of world literature. *Scientometrics*, **21** (2), 147-157.

Full Text: [1991\Scientometrics21, 147.pdf](1991/Scientometrics21,%20147.pdf)

Abstract: An analysis of the output of the literature scanned in Engineering Index during 1970-84 on solar power research indicates that the growth of the literature had been vigorous after the energy crisis in 1973 till 1982. The number of papers at conferences are quite close to the number of references in journals. The area of solar collectors and solar cells has received maximum attention. Publication output of literature by different countries follows the trend in basic sciences with USA being the major producer. The research activity became global after the energy crisis. Performance of the developed countries is low in some fields of solar power.

Keywords: Analysis, Conferences, Growth, Journals, Literature, Papers, Research, Sciences, USA

? Englisch, H. (1991), Monotonous structure measures for social-groups. *Scientometrics*, **21** (2), 159-169.

Full Text: [1991\Scientometrics21, 159.pdf](1991/Scientometrics21,%20159.pdf)

Abstract: The structure measure by Kretschmer1 estimates the cooperation of a scientist. It is generalized in such a way that it increases with respect to the cooperation strength with one of the collaborators. An alternative to the hierarchical structure measure is proposed which is continuous in all cooperation strengths.

Keywords: Alternative, Citations, Cooperation, Estimates, Hierarchical Structure, Structure

? Zhu, J., Meadows, A.J. and Mason, G. (1991), Citations and departmental research ratings. *Scientometrics*, **21** (2), 171-179.

Full Text: [1991\Scientometrics21, 171.pdf](1991/Scientometrics21,%20171.pdf)

Abstract: A recent extensive review of research in British universities has produced a research rating for each university department based primarily on peer review of the department’s publications. In this preliminary study, we compare these ratings with publication and citation data for the chemistry departments at two British universities. The results underline the importance of the most productive researchers in departments. This point is supported by citation data from a chemical engineering department.

Keywords: Chemistry, Citation, Peer Review, Peer-Review, Publication, Publications, Research, Review, Universities, University

? Burrell, Q.L. (1991), The Bradford distribution and the Gini index. *Scientometrics*, **21** (2), 181-194.

Full Text: [1991\Scientometrics21, 181.pdf](1991/Scientometrics21,%20181.pdf)

Abstract: It is pointed out that the so-called “Bradford distribution” derived by Leimkuhler is more properly viewed as the theoretical form of a variant of the Lorenz curve. The equation of this Leimkuhler curve allows an easy calculation of the Gini coefficient of concentration which can be compared with empirical values.

Keywords: Lorenz, Rule

Notes: UUniversity

? Zachos, G. (1992), Research output evaluation of two university departments in Greece with the use of bibliometric indicators. *Scientometrics*, **21** (2), 195-221.

Full Text: [1991\Scientometrics21, 195.pdf](1991/Scientometrics21,%20195.pdf)

Abstract: The results of a study for evaluating research performance of two Greek University Departments of Mathematics are presented. In order to achieve this elements from the Sussex and Leiden methodologies of constructing and using bibliometric indicators were used. Comparison of the two groups were based on their similarities. The convergence of bibliometric indicators procedure as applied in Leiden methodology together with a number new bibliometric indicators were used. Results shown that bibliometric indicators if applied properly may give very interesting information on the research performance and nature of research carried out in University Departments.

Keywords: Bibliometric, Bibliometric Indicators, Greece, Indicators, Information, Methodology, Research, Research Performance, Science

Lewison, G. and Cunningham, P. (1991), Bibliometric studies for the evaluation of trans-national research. *Scientometrics*, **21** (2), 223-244.

Full Text: [1991\Scientometrics21, 223.pdf](1991/Scientometrics21,%20223.pdf)

Abstract: Results are given of an analysis of the scientific papers describing work carried out under two European Community research programmes, in biotechnology and environmental chemicals. They were shown to be more multinational in their authorship than other papers in the same journals, and as a consequence, more frequently cited in the 5 years following publication. The citation rates peak early for the biotechnology papers suggesting that effective measures have been taken to disseminate the results of the work to other scientists so that they have become aware of them earlier than usual

Keywords: Analysis, Authorship, Biotechnology, Citation, Environmental, Journals, Papers, Publication, Research, Work

? Bonzi, S. and Snyder, H.W. (1991), Motivations for citation - A comparison of self citation and citation to others. *Scientometrics*, **21** (2), 245-254.

Full Text: [1991\Scientometrics21, 245.pdf](1991/Scientometrics21,%20245.pdf)

Abstract: The citation motivations among 51 self citing authors in several natural science disciplines were investigated. Results of a survey on reasons for both self citation and citation to others show that there are very few differences in motivation, and that there are plausible intellectual grounds for those differences which are substantial. Analysis of exposure in text reveals virtually no differences between self citations and citations to others. Analysis of individual disciplines also uncover no substantive differences in either motivation or exposure in text.

Keywords: Citation, Citations, Classification, Exposure, Science, Self, Self-Citation, Survey

? Massimo, L. (1991), The use of indicators in the research-and-development evaluation activity of the European communities. *Scientometrics*, **21** (3), 255-262.

Full Text: [1991\Scientometrics21, 255.pdf](1991/Scientometrics21,%20255.pdf)

Abstract: The goals of the evaluation of the R & D programmes of the Commission of the European Communities is to assess, beside scientific and technical achievements, the added value due to the implementation of these activities at European level. This requires the development of techniques different from those normally used for the measurement of scientific output. In particular a number of indicators have been developed to assess international cooperation promoted by EC programmes and the resulting economic and industrial impact.

Keywords: Cooperation, Development, EC, Evaluation, Indicators, International, International Cooperation, Measurement, Scientific Output, Techniques

? Bobe, B. (1991), Trends in the use of research-and-development output indicators in EC program-evaluation. *Scientometrics*, **21** (3), 263-282.

Full Text: [1991\Scientometrics21, 263.pdf](1991/Scientometrics21,%20263.pdf)

Abstract: This paper rests upon a review of 15 evaluation reports of R & D programmes worked out during the 80’s by the European Commission. The analysis aims at answering the main questions: Why did emerge the needs for output indicators in the middle of the 80’s? What kind of output indicators were built up (or tentative)? With which methodology? What were their actual use in the evaluation reports? The linkage between EC R & D policies and evaluation is examined in order to discuss the relationships between the goals of R & D programmes and the criteria for evaluation. It is shown that the followed evaluation methodology and the evaluation goals at hand are paramount for the choice of output indicators: such goals encompass a.o. the description of the programmes, the assessment of the contractors opinion, the appraisal of the “techno-economic” effects of the programmes. As a result “expected output indicators” were developed (BRITE programme). On the other hand, one has called “meta-evaluation”, the indirect measurement of Scientific results by bibliometry (BEP-BAP programmes). Similarly, “intermediate indicators” were built up for evaluating the programmes management performance (ESPRIT programme). At last “derived output indicators” were used for techno-economic evaluation, (EURAM programmes) leading to the quantified global judgement of a “before-after” methodology, (SCIENCE-STIMULATION programmes).

Keywords: Analysis, Assessment, Bibliometry, Criteria, Ec, Evaluation, Indicators, Linkage, Management, Measurement, Methodology, Needs, Review

? Collins, P.M.D. and Ringe, M.J. (1991), Europeanization of the market for contract research. *Scientometrics*, **21** (3), 283-289.

Full Text: [1991\Scientometrics21, 283.pdf](1991/Scientometrics21,%20283.pdf)

Abstract: This paper outlines the results of a recent survey of the UK contract research market, estimated at 900 MECU (1988/89). Most UK contract research organization (CROs) undertake a small but significant amount of overseas contract R & D (both for other Member States and elsewhere), and see this increasing as the Single European Market (SEM) develops. Most UK CROs have participated in EC R & D programmes and viewed involvement as a, generally, positive experience. UK Industrial customers of contract R & D, although more UK orientated, also believe the SEM will increase the amount of contracting from Member States. Industrial companies involved in EC R & D programmes also noted benefits from involvement. Both UK CROs and the industrial customer organizations saw the SEM and the associated Europeanization process as enhancing commercial contacts with organizations in other Member States.

Keywords: Contract, EC, Market, Research, SEM, Small, Survey, UK

? Moed, H.F., Debruin, R.E., Nederhof, A.J. and Tijssen, R.J.W. (1991), International scientific cooperation and awareness within the European community - Problems and perspectives. *Scientometrics*, **21** (3), 291-311.

Full Text: [1991\Scientometrics21, 291.pdf](1991/Scientometrics21,%20291.pdf)

Abstract: International scientific co-operation (ISC) and awareness are topics of increasing interest for both scientists and science policy makers. In this paper, we adopt primarily the science policy point of view. After a concise overview of the literature we summarize the main results of the research we conducted. The main outcome with respect to ISC is that it increases. However, large differences exist between countries and between scientific disciplines. ISC and awareness constitute a complex phenonenon, affected by several factors, science-internal, as well as external. In the paper several techniques are described, amongst which those that can visualize ISC relations through analytical maps. An important aspect of our research methodology is the combination of various quantitative, bibliometric analyses and qualitative research on the structure of science and the relations between science and society. Finally, we sketch perspectives for future research.

Keywords: Bibliometric, Cooperation, Literature, Methodology, Policy, Qualitative, Qualitative Research, Relations, Research, Science, Science Policy, Society, Structure, Techniques

Narin, F., Stevens, K. and Whitlow, E.S. (1991), Scientific cooperation in Europe and the citation of multinationally authored papers. *Scientometrics*, **21** (3), 313-323.

Full Text: [1991\Scientometrics21, 313.pdf](1991/Scientometrics21,%20313.pdf)

Abstract: Under the sponsorship of the U.S. National Science Foundation, CHI Research, Inc. developed the bibliometric indicators for the U.S. National Science Board’s Science Indicators Reports starting with Science Indicators 1972. In the work reported here, for the Commission of the European Communities, CHI has extended the Science Indicators techniques and database to a study of publication, coauthorship and citation within 28 scientific fields related to various European Community programs.

Perhaps the most important finding of the research was that internationally coauthored papers - papers authored by scientists affiliated with institutions in more than one EC country - were cited two times as highly as papers authored by scientists working at a single institution within a single country. These EC-EC internationally coauthored papers were cited as highly as EC-Non EC and Non-EC papers. This indicates that the internationally linked European science is of as high impact as any other science in the world.

A second key finding was that, after compensating for national scientific size, the degree of international coauthorship did not appear to be particularly dependent upon size. However, linguistic and cultural factors were found to be very strong. The patterns of coauthorship amongst the European countries are far from homogeneous, and are quite heavily affected by linguistic, historical, and cultural factors.

Finally, it was found that international coauthorship is increasing steadily, both within and outside of the Community, with some evidence that international cooperation is increasing more rapidly in scientific fields that have been targeted by the Commission.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Coauthorship, Cooperation, Cultural, Database, EC, Europe, Evidence, Indicators, Institutions, International, International Cooperation, Papers, Publication, Research, Science, Size, Techniques, Work

? Dahl, M. and Lahlou, S. (1991), Measurement of network effects from the EC science stimulation programs. *Scientometrics*, **21** (3), 325-342.

Full Text: [1991\Scientometrics21, 325.pdf](1991/Scientometrics21,%20325.pdf)

Abstract: Each of the EC research programmes has to be evaluated with respect to their objectives. This paper describes the study of the effects of the SCIENCE/STIMULATION Programmes on all the laboratories that participated in contracts which were still running at the time of the study. The study was designed with special regard to the short time available. Nevertheless, it yielded sufficient data to justify a clustering of the laboratories networks in four classes as they looked before the contract and in six classes as they looked afterwards. Thus, the study provided quantification of the links among the laboratories. We find that the method is feasible within the constraints set, but we recommend that further theoretical work be done on the concept of networks as well as on the processing of the data and, more ambitiously, that more global studies be made possible by use of this method on other surveys.

Keywords: Clustering, Contract, EC, Research, Work

? Teichler, U. (1991), Evaluation of the EC training fellowship program based on a fellows questionnaire survey. *Scientometrics*, **21** (3), 343-365.

Full Text: [1991\Scientometrics21, 343.pdf](1991/Scientometrics21,%20343.pdf)

Abstract: Major findings are reported of a survey of scientists and engineers awarded an EC Training Fellowship between 1966 and 1988. 472 former fellows and 140 renonces, i.e. declining the fellowship awarded, report about academic experiences in another EC country and administrative issues of the fellowship as well as subsequent careers. The article places special emphasis on the 12 percent of former fellows from less favoured regions of the European community. They turn out to regard the fellowship more favourably than fellows from advanced regions, but would prefer other options, if they could decide again.

Keywords: Careers, Community, EC, Survey

? Higgins, T. (1991), Indicators of European scientific cohesion. *Scientometrics*, **21** (3), 367-381.

Full Text: [1991\Scientometrics21, 367.pdf](1991/Scientometrics21,%20367.pdf)

Abstract: Cohesion, as a concept, may be related to symbiosis. It implies an association of dissimilar entities to their mutual advantage. It is a particularly appropriate concept for the Community itself, and a very important one, as Europe moves towards greater integration. Economic, political and institutional integration will occur more easily and quickly if cohesion between the different elements involved can be achieved. Cohesion of the European scientific Community, can play a role in assisting (or delaying) the overall movement of the Community towards greater and more lasting integration. Cohesion of the scientific community implies, among other things, - free and open exchange of information, - joint planning and execution of projects, - access to facilities and results, - narrowing of disparities in scientific and technical capability between regions and Member States. There is evidence that progress is being made in respect of a number of these. Under the stimulus of the Framework Programme, the scientific community in Europe has become a more cohesive force. An important indicator of this is the level of participation by regions and Member States in the Programme. However, while some regions and Member States are major participants, there are grounds for concern about the level of participation of certain peripheral and Less Favoured Regions.

Keywords: Access, Association, Community, Europe, Evidence, Facilities, Force, Indicator, Information, Integration, Planning

Lewison, G. (1991), The scientific output of the ECs less favored regions. *Scientometrics*, **21** (3), 383-402.

Full Text: [1991\Scientometrics21, 383.pdf](1991/Scientometrics21,%20383.pdf)

Abstract: Results are given of a bibliometric study covering 1977-86 and 28 scientific fields defined by journals and title keywords. Attention was focussed on publications from less favoured regions of the EC, containing 20% of the population, 10% of the g.d.p., but only 5% of scientific output, although this is growing rapidly. The scientific strengths of the different LFRs vary and details are given. Finally, some appropriate indicators are suggested to measure the effectiveness of scientific infrastructure support planned for these regions.

Keywords: Bibliometric, Bibliometric Study, EC, Effectiveness, Indicators, Journals, Population, Publications, Scientific Output

Tsipouri, L.J. (1991), Effects of EC research-and-development policy on Greece: Some thoughts in view of the stride program. *Scientometrics*, **21** (3), 403-416.

Full Text: [1991\Scientometrics21, 403.pdf](1991/Scientometrics21,%20403.pdf)

Abstract: Evidence from Greece suggests that after its accession to the EC the country benefited from a limited transfer of resources in form of R & D subsidies, which were heavily concentrated both sectorally and institutionally, hardly leading to marketable innovations. A detailed analysis shows though that the country benefited more from the EC technology policy in the form of a) subsidies for R & D infrastructure and b) quick adaptation of its institutions to new challenges. Based on this experience it is suggested that STRIDE, a Community R & D programme for less favoured regions, be evaluated with both cohesion and excellence indicators.

Keywords: Adaptation, Analysis, Countries, EC, Figures, Greece, Indicators, Institutions, Management, Policy, Publication Output, Relative Citation Impact, Science, Search, Technology, Version

? Grupp, H., Schmoch, U. and Kuntze, U. (1991), Patents as potential indicators of the utility of EC research programs. *Scientometrics*, **21** (3), 417-445.

Full Text: [1991\Scientometrics21, 417.pdf](1991/Scientometrics21,%20417.pdf)

Abstract: In the framework of the MONITOR-SPEAR programme of the Commission of the European Communities a critical review of the literature with regard to the utility of patent indicators being in use for evaluation world-wide has been undertaken. Availability, scope and complementarity of these indicators are discussed. A practical tool to use patent indicators for evaluation committees of EC programmes is designed and recommendations for EC procedures are given. The suggested procedures will be implemented alongside three sample exercises. One of the exercise programmes is science-led (BEP and BAP), one industry-led (BRITE I) and one interphase (MHR). In this paper only selected examples with respect to the MHR programme are outlined and discussed. The project is not completed yet and only preliminary findings will be given in this paper. From the viewpoint of its present state it is concluded that patent indicators may play a very useful role within a mixed set of evaluation procedures. The intersection with other methods is not very large, that is, patent indicators may provide supplementary information to a large extent. However, their use is limited to those types of programmes which are relevant for intellectual property rights mostly in the commercial realm. Patent indicators share with other evaluation tools the problem of best adjustment of time windows between observation and execution of the programme. Despite of these limitation, patent indicators may be employed properly as output indicators related to ongoing EC programmes, but as well for prospective analysis of applied fields of R & D and may thus help in the definition phase of new R & D programmes.

Keywords: Analysis, EC, Evaluation, Framework, Indicators, Information, Innovation, Intellectual Property, Literature, Methods, Patent, Procedures, Recommendations, Review, Rights, Utility

? Courtial, J.P. and Callon, M. (1991), Indicators for the Identification of Strategic Themes Within A Research-Program. *Scientometrics*, **21** (3), 447-458.

Full Text: [1991\Scientometrics21, 447.pdf](1991/Scientometrics21,%20447.pdf)

Abstract: The co-word method (Leximappe programme) is used to illustrate the essential themes of international research based on the computer analysis of databases of scientific articles and patents. Further, we illustrate that these themes often follow characteristic cycles. Research projects submitted to a research funding organisation were subjected to a similar analysis. It was then possible in one sense to evaluate the relevance of funding support, particularly in terms of the degree of maturity of international research.

Keywords: Analysis, International, Patents, Relevance, Research, Research Funding

? Parthey, H. and Schuetze, W. (1991), Distribution of publications as an indicator for the evaluation of scientific programs. *Scientometrics*, **21** (3), 459-464.

Full Text: [1991\Scientometrics21, 459.pdf](1991/Scientometrics21,%20459.pdf)

Abstract: This article describes investigations into the publication behaviour of scientific authors from the GDR. The obtained data revealed that - analogous to the Lotka-distribution - not only a fifth of all authors produce half of the publications of a certain institute, but that these authors also have a quicker reaction time and receptivity to new international research problems. These findings may make it possible to substantiate proposals by guiding scientists in the direction of themes, respectively to help the science policy in the process of the elaboration of new research programs.

Keywords: Behaviour, International, Policy, Publication, Publications, Research, Science, Science Policy

? Barre, R. (1991), Indicators of the emerging european S-and-T space - Results of the 1st international-conference on european S-and-T indicators. *Scientometrics*, **21** (3), 465-469.

Full Text: [1991\Scientometrics21, 465.pdf](1991/Scientometrics21,%20465.pdf)

Abstract: The European construction has been developping in new areas and at an accelerated pace for the last few years, in the perspective of the single European market of 1993. One of the important aspects of this evolution has been the establishment of a “European science and technology (S & T) space”, through the successive “Framework Programs” of the Commission of the European Community. The present conference highlighted one result: we have now measurable hints of the emergence of such a “European S & T space”. The various papers which were presented document indeed the various facets of this new reality of a multinational research system taking shape. This new reality has been put in evidence through a series of appropriate S & T indicators. These indicators have been developped by a number of research teams, in general with the financial support of the EC, as a response to an evaluation challenge linked itself to a S & T policy one. In turn, they led to a challenge on S & T indicators: this conference showed that the latter could - at least partially - be met.

Keywords: EC, Evaluation, Evidence, Evolution, Financial Support, Indicators, Market, Papers, Policy, Research, Science, Science and Technology, Technology

? Turner, W.A. (1991), An introduction to scientometrics in France. *Scientometrics*, **22** (1), 5-8.

Full Text: [1991\Scientometrics22, 5.pdf](1991/Scientometrics22,%205.pdf)

Keywords: France, Scientometrics

? Davoust, E. and Schmadel, L.D. (1991), A study of the publishing activity of astronomers since 1969. *Scientometrics*, **22** (1), 9-39.

Full Text: [1991\Scientometrics22, 9.pdf](1991/Scientometrics22,%209.pdf)

Abstract: This is a statistical analysis of the publishing activity of astronomers worldwide, as measured by the number of papers and monographs published in the period 1969-87. Both the astronomical literature and the number of authors publishing in the field are increasing rapidly. The distribution of productivity among astronomers is followed in time, thus revealing the evolution of research methods and publication strategies in the past 19 years. Fourteen “superproductive” astronomers, who published over 150 papers in 15 years, and the subsample of French astronomers active in 1986 are investigated separately.

Keywords: Ages, American Astronomers, Analysis, Citations, Evolution, Growth, Literature, Methods, Most-Cited Papers, Papers, Publication, Publishing, Rates, Research, Statistical Analysis

? Le Minor, S. and Dostatni, P. (1991), A bibliometric study of the publications of the French national institute for health and medical research (INSERM). *Scientometrics*, **22** (1), 41-64.

Full Text: [1991\Scientometrics22, 41.pdf](1991/Scientometrics22,%2041.pdf)

Abstract: An ‘INSERM bibliometric database’, which lists the publications of researchers at the French National Institute for Health and Medical Research, was compiled by downloading references from the MEDLINE and the Science Citation Index (SCI) bibliographical databases, and by using micro-computing techniques. MEDLINE and the SCI proved to be complementary data sources well-suited to this work. Initial results of an analysis of this INSERM bibliometric database are given. They help to situate the organization’s written production in a national and an international context and, in particular, to trace the ‘profile’ of the Institute’s researchers and the impact of the journals used in their publications.

Keywords: Analysis, Bibliometric, Complementary, Database, International, Journals, MEDLINE, Publications, SCI, Science Citation Index, Techniques, Work

? Jagodzinskisigogneau, M., Bauin, S., Courtial, J.P. and Feillet, H. (1991), Scientific innovation in bibliographical databases - A comparative-study of the science-citation-index and the pascal database. *Scientometrics*, **22** (1), 65-82.

Full Text: [1991\Scientometrics22, 65.pdf](1991/Scientometrics22,%2065.pdf)

Abstract: This study compares information obtained from the INIST/CNRS bibliographical database PASCAL with that found in the Atlas of Science published by ISI. The goal of the comparison was to contribute to a better understanding of how databases can be used to carry out fine-grained studies of social and cognitive factors which affect the definition of a scientific research program. The program studied concern the development of research on “brush-border” cell membranes.

Keywords: Comparison, Database, Development, Information, ISI, Research, Science Citation Index, Scientific Research, Understanding

? Dou, H., Quoniam, L. and Hassanaly, P. (1991), The scientific dynamics of a city - A study of chemistry in Marseilles from 1981 to the present. *Scientometrics*, **22** (1), 83-93.

Full Text: [1991\Scientometrics22, 83.pdf](1991/Scientometrics22,%2083.pdf)

Abstract: In a study of scientific publications originating from laboratories in the city of Marseille, we look at both the quantitative evolution of these publications over time and their thematic development. Using the section headings of the Chemical Abstract database, we identify the principal research poles of the city and their relationships.

Keywords: Database, Development, Evolution, Publications, Research, Scientific Publications

? Barre, R. (1991), Clustering research fields for macro-strategic analysis - A comparative specialization approach. *Scientometrics*, **22** (1), 95-112.

Full Text: [1991\Scientometrics22, 95.pdf](1991/Scientometrics22,%2095.pdf)

Abstract: The goal of this article is to show that it is possible to construct an index to measure a country’s relative specialization in different scientific fields in a way which is both reliable and relevant for macro-strategic analysis. We will call this index a “Revealed Scientific Advantages Index”. The technical problem to be discussed is one of aggregation: how can we be sure that an index calculated for a small number of relatively large fields does not mask significant differences that might have shown up had a lower level of data aggregation been used? Science policy needs synthetic measures which am easy to interpret. We will show that the “Revealed Scientific Advantages’ approach offers the possibility of building them. The study itself is based on figures obtained through an exploitation of the INIST/CNRS PASCAL database classification of science. 107 sub-fields of this classification were initially used to determine the areas of specialization for 11 countries (“revealed national advantages”). Clustering techniques were then used to aggregate this data and 13 specific fields were identified. The science policy information produced during the study concerned these 13 fields. It proved to be both easily understandable and relevant for macro-strategic analysis.

Keywords: Aggregation, Analysis, Classification, Database, Information, Needs, Policy, Science, Science Policy, Small, Techniques

Bauin, S., Michelet, B., Schweighoffer, M.G. and Vermeulin, P. (1991), Using bibliometrics in strategic analysis: ‘Understanding chemical reactions’ at the CNRS. *Scientometrics*, **22** (1), 113-137.

Full Text: [1991\Scientometrics22, 113.pdf](1991/Scientometrics22,%20113.pdf)

Abstract: This article presents the results of a study carried out for CNRS policy makers. The goal of the study was two-fold, first, it was aimed at evaluating the research effort devoted to ‘understanding chemical reactions’ both in France and throughout the world, second, it was designed to test the usefulness of bibliometric techniques for strategic analysis. One feature of this article merits special attention. It is co-signed by the researchers who carried out the study and by the policy makers for whom it was intended.

Keywords: Analysis, Bibliometric, Bibliometric Techniques, Bibliometrics, Citation, Co-Word Analysis, Feature, First, France, Policy, Research, Science, Techniques

? Turner, W.A. and Rojouan, F. (1991), Evaluating input output relationships in a regional research network using co-word analysis. *Scientometrics*, **22** (1), 139-154.

Full Text: [1991\Scientometrics22, 139.pdf](1991/Scientometrics22,%20139.pdf)

Abstract: In this study, a network management approach to science policy decision-making guided our efforts to develop new co-word analysis techniques for the evaluation of regional research policies. A rich collection of factual data was gathered on inputs into the local research system (funding, personnel, equipment, ...). This data was then combined with the results of a co-word analysis of the region’s publication output. The network management approach is useful in helping to determine the nature of input/output relationships in a regional context.

Keywords: Analysis, Decision Making, Decision-Making, Equipment, Evaluation, Management, Network, Personnel, Policy, Publication, Research, Science, Science Policy, Techniques

? Callon, M., Courtial, J.P. and Laville, F. (1991), Co-word analysis as a tool for describing the network of interactions between basic and technological research - The case of polymer chemistry. *Scientometrics*, **22** (1), 155-205.

Full Text: [1991\Scientometrics22, 155.pdf](1991/Scientometrics22,%20155.pdf)

Abstract: The goal of this paper is to show how co-word analysis techniques can be used to study interactions between academic and technological research. It is based upon a systematic content analysis of publications in the polymer science field over a period of 15 years. The results concern a.) the evolution of research in different subject areas and the patterns of their interaction, b.) a description of subject area “life cycles”, c.) an analysis of “research trajectories” given factors of stability and change in a research network, d.) the need to use both science push and technology pull theories to explain the interaction dynamics of a research field. The co-word techniques developed in this paper should help to build a bridge between research in scientometrics and work underway to better understand the economics of innovation.

Keywords: Analysis, Dynamics, Economics, Evolution, Innovation, Interaction, Network, Polymer, Publications, Research, Science, Scientometrics, Stability, Techniques, Technology, Work

? Mauguin, P. (1991), Using a contracts database for evaluating the dynamics of a technological program - The case of the European nonnuclear energy program. *Scientometrics*, **22** (1), 207-228.

Full Text: [1991\Scientometrics22, 207.pdf](1991/Scientometrics22,%20207.pdf)

Abstract: In the scope of the evaluation of the European program of the R & D on non nuclear energies, we have chosen to study the contracts between the operator of the program, here the Commission of the European Communities, and the teams selected at the issue of a call for tenders. These contracts, recorded on a computerised accounting database, gather information on the 3 important inputs of a program: The teams involved the themes of the research and the financial level. After corrections, the base gathered 421 research actions, summing up nearly 650 teams for a total cost of 350 MECU. Different statistical treatments have been applied to this base, allowing to characterize the main outlines of the program, its advancement and its dynamic, globally and more acutely on the research’s fields that it has supported. The method of analysis ‘themes allois’ which is proposed applied to a base of contracts slightly transformed thus prefigures a tool for strategic management of technological programs.

Keywords: Analysis, Cost, Database, Evaluation, Information, Management, Research, Strategic Management

Zitt, M. (1991), A simple method for dynamic scientometrics using lexical analysis. *Scientometrics*, **22** (1), 229-252.

Full Text: [1991\Scientometrics22, 229.pdf](1991/Scientometrics22,%20229.pdf)

Abstract: Techniques for studying problematic networks in science and technology are principally derived either from citation analyses or from lexical methods. The former have been the object of many developments and improvements. A considerable range of applications exists within the practical constraint of their being limited to fields covered by the ISI databases. For the latter, the co-word method has a register of applications that up until now have been more specialized in the sociology of ‘science as it is done’, but it has in principle no field limitations. An important question is whether we can extend the application range of this analytical method to take in longer periods, and in particular to deal with historiography either on a large scale (at the level of a research field) or on a small scale (at the level of a process of discovery or invention). Here we propose a way of rendering lexical methods dynamic, more particularly through developing a rudimentary but precise technique to aid historiographical analysis. This method of critical variations is illustrated in a working example.

Keywords: Analysis, Citation, Co-Citation, Discovery, ISI, Methods, Research, Science, Science and Technology, Scientometrics, Small, Sociology, Technology

? Gillett, R. (1991), Pitfalls in assessing research performance by grant income. *Scientometrics*, **22** (2), 253-263.

Full Text: [1991\Scientometrics22, 253.pdf](1991/Scientometrics22,%20253.pdf)

Abstract: The strategy of judging the quality of scientific research by the level of funding it attracts is critically examined. It is argued that an index such as per capita research income, which is based on grant-giver peer review, yields an unsatisfactory measure of scientific performance. It fails to fulfil a basic requirement of a performance indicator, namely, that it should relate outputs to inputs. It has intrinsically low validity, and is strongly confounded with a variety of extraneous factors that are unrelated to research performance.

Keywords: Departments, Indicator, Peer Review, Peer-Review, Quality, Requirement, Research, Research Performance, Review, Scientific Research, UGC Evaluation, Validity

? Jaschek, C. (1991), The size of the astronomical community. *Scientometrics*, **22** (2), 265-282.

Full Text: [1991\Scientometrics22, 265.pdf](1991/Scientometrics22,%20265.pdf)

Abstract: The number of astronomers living at different times is analyzed, from the classic antiquity to modern times through the different available statistics. For present times the number is estimated to be about 9.000, this number grows exponentially. A zero order model is proposed to pass from the annual number of authors of papers to the number of active astronomers.

Keywords: Living, Model, Papers, Statistics

Sengupta, I.N. and Henzler, R.G. (1991), Citedness and uncitedness of cancer articles. *Scientometrics*, **22** (2), 283-296.

Full Text: [1991\Scientometrics22, 283.pdf](1991/Scientometrics22,%20283.pdf)

Abstract: There is a rapid growth of cancer literature. Thousands of papers are being regularly published every year not only in speciality journals, but also in journals of other disciplines. Citation studies are nowadays considered a major basis of science indicators for ascertaining the importance of a scientific journal and that of the published articles on a particular subject. In oncological research the journal Cancer is considered as one of the top most journals and is universally well known for its high standard and excellence. In this paper an attempt has been made to find out the importance of all the articles published in it for a particular year. Side by side bibliometric analysis was made to ascertain various other aspects like time lag between publication and first citation of articles, average citation time, subject scattering and identification of most important journals in the field etc. It is believed that this study would be of help to the working oncologists, librarians and information scientists to assess the importance of articles published in a top ranking journal of cancer and also that of different journals publishing oncological research results.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Cancer, Citation, First, Growth, Identification, Indicators, Information, Journal, Journals, Literature, Papers, Publication, Publishing, Ranking, Research, Scattering, Science, Science Indicators, Standard

? Cano, V. and Lind, N.C. (1991), Citation life-cycles of 10 citation-classics. *Scientometrics*, **22** (2), 297-312.

Full Text: [1991\Scientometrics22, 297.pdf](1991/Scientometrics22,%20297.pdf)

Abstract: Not all highly cited papers have the same citation life cycle curves, i.e. curves of frequency of citations received vs. time. The citation life of ten randomly selected Citation Classics, five in medicine and five in biochemistry, are studied longitudinally in time and compared with a random sample of ten non-classics of the same cohort. There are pronounced differences in the life cycle curves, two distinct types are suggested. Type A, comprised of both high and low cited papers in both fields, has an early peak of citation rate and may be approximated by a bilinear cumulative citation curve with a break at six years of age, when three quarters of the total number of citations have occurred. Type B, in this study comprised of extremely highly cited methodological Citation Classics, exhibit a constant or slowly accelerating growth rate with a vigorous citation life extending over the entire period studied and typically one third or less of the total citations accumulated at six years of age.

Keywords: Biochemistry, Citation, Citations, Growth, Growth Rate, Life, Medicine, Papers, Patterns, Random Sample

? Lindsey, D. (1991), Precision in the manuscript review process - Hargens and herting revisited. *Scientometrics*, **22** (2), 313-325.

Full Text: [1991\Scientometrics22, 313.pdf](1991/Scientometrics22,%20313.pdf)

Abstract: Lindsey recently examined the precision of the manuscript review process using a stochastic model. The study reported that the low reliability found by previous studies results in journals publishing a large number of papers that should otherwise be rejected and rejecting an equally large number of papers that should be accepted. Hargens and Herting have criticized this view. This paper addresses their criticisms. The paper includes an examination of sociology journals using impact scores. The differences between journals is noted. Part of the variation between sociology journals derives from their editorial operations. Central to their editorial operations is the reviewing of manuscripts for publication. Not all journals perform this task equally well. The consequences of poor editorial management are discussed. To improve the quality of published work journals need to reduce the low reliability of the current manuscript review process.

Keywords: Examination, Journals, Management, Model, Papers, Publication, Publishing, Quality, Referees, Reliability, Review, Review Process, Sociology, Stochastic Model, Work

? Frame, J. (1991), Modeling national technological capacity with patent indicators. *Scientometrics*, **22** (3), 327-339.

Full Text: [1991\Scientometrics22, 327.pdf](1991/Scientometrics22,%20327.pdf)

Abstract: Scientific, technological, and economic data are investigated for 128 countries. A stepwise regression analysis is carried out on the data, using domestic patent counts as the dependent variable. The form of the regression equations is the Cobb-Douglas production function. The analysis shows that domestic patents (as indicator of national technological capacity, and treated here as the dependent variable) are closely related to GNP (a measure of national economic size), counts of scientific publications (an indicator of scientific capacity), and counts of national patents obtained in the U.S. (a measure of world class technological capacity). Together, these three independent variables account for more than 92 percent of the variance in the dependent variable.

Keywords: Analysis, Capacity, Function, Indicator, Modeling, Patent, Patents, Publications, Regression Analysis, Scientific Publications, Size

? Pianta, M. and Archibugi, D. (1991), Specialization and size of scientific activities - A bibliometric analysis of advanced countries. *Scientometrics*, **22** (3), 341-358.

Full Text: [1991\Scientometrics22, 341.pdf](1991/Scientometrics22,%20341.pdf)

Abstract: The relationship between the size of national scientific activities of advanced countries and the degree of specialization by fields of science is examined using bibliometric indicators of the number of papers and of paper citations. A negative relation between the amount of scientific activity and the degree of scientific specialization has emerged, with Japan and, to a lesser extent Italy, showing a specilization degree higher than expected. Countries with established scientific traditions (such as the US, the UK, the Netherlands, and Switzerland) have a lower than expected specialization degree, suggesting a more diversified range of research activities. Over time, however, most countries have reduced their scientific specialization, a pattern which is in contrast with recent research on patents and technological specialization.

Keywords: Bibliometric, Bibliometric Indicators, British Science, Citations, Decline, Indicators, Italy, Japan, Paper Citations, Papers, Patents, Research, Science, Size, Switzerland, The Netherlands, UK, US

? Yamazaki, S. (1991), Academic origin of the 1st professors in American medical-schools before the civil-war. *Scientometrics*, **22** (3), 359-368.

Full Text: [1991\Scientometrics22, 359.pdf](1991/Scientometrics22,%20359.pdf)

Abstract: The development of American medical education before the Civil War was studied. One hundred and forty-three first professors in American medical schools before the Civil War were selected, and records of their academic origins, places of birth, and study abroad were collected from various biographical sources. Based on the prosopographical analysis of personal data of first professors, the historical changes and the characteristics in American medical education are discussed.

Keywords: Analysis, Antebellum, Changes, Development, Education, First, Medical, Medical Education, Medical Schools, Records

? Balmer, B. and Martin, B.R. (1991), Who’s doing what in human genome research. *Scientometrics*, **22** (3), 369-377.

Full Text: [1991\Scientometrics22, 369.pdf](1991/Scientometrics22,%20369.pdf)

Keywords: Biology, Project

? Schubert, A. and Braun, T. (1992), 3 Scientometric etudes on developing-countries as a tribute to Moravcsik, Michael. *Scientometrics*, **23** (1), 3-19.

Full Text: [1992\Scientometrics23, 3.pdf](1992/Scientometrics23,%203.pdf)

Abstract: The three scientometric etudes presented in this paper are dealing with three aspects of science in developing countries: (1) estimation of scientific manpower and publication potential is given using the Waring model of publication productivity, (2) co-authorship patterns are analyzed to conclude that local interactions among developing countries are dominant, but the historical-political-geographical connections are also vivid, and (3) a “quasi-4D comparison of socio-economic and scientometric indicators is presented using “Chernoff faces”.

Keywords: Citation Impact, Co-Authorship, Coauthorship, Comparison, Distributions, Indicators, Model, Potential, Productivity, Publication, Publication Output, Science, Scientometric

Meneghini, R. (1992), Brazilian production in biochemistry. The question of international versus domestic publication. *Scientometrics*, **23** (1), 21-30.

Full Text: [1992\Scientometrics23, 21.pdf](1992/Scientometrics23,%2021.pdf)

Abstract: This work describes a bibliometric survey on scientific production in biochemistry originated from 19 Brazilian institutions, which comprised 487 staff investigators, 70-80% of investigation-active biochemists. These investigators published about 3000 papers in international journals in the period 1970-1985, which generated about 17000 citations from 1983 to 1987, according to the Institute for Scientific Information data base. In this survey we distinguished what we called endogenous articles (produced in Brazil) from exogenous articles (produced abroad by Brazilian biochemists), in terms of the spectrum of journals in which they were published and the number of citations generated per article. A comparison was also performed for the two groups in terms of the impact factor generated by Brazilian articles in a given journal versus the expected impact factor for all articles published in that journal. In all cases we detected a certain disadvantage for endogenous articles, the possible reason of which is discussed. Biochemistry is one of the scientific areas in Brazil in which the investigators make a large effort to publish in international journals. We observed differences in the impact generated by these international papers, when biochemistry was compared with other areas which exhibit the same tendency towards an international output. From these observations we discuss the pertinence of publishing for an international audience as opposed in domestic journals

Keywords: Bibliometric, Bibliometric Survey, Biochemistry, Brazil, Citations, Comparison, Data Base, Impact Factor, Institute for Scientific Information, Institutions, International, Journal, Journals, Papers, Publishing, Scientific Production, Survey, Work

? Sen, B.K. and Shailendra, K. (1992), Evaluation of recent scientific research output by a bibliometric method. *Scientometrics*, **23** (1), 31-46.

Full Text: [1992\Scientometrics23, 31.pdf](1992/Scientometrics23,%2031.pdf)

Abstract: Describes a new method of evaluation of scientific output by laboratories engaged in diverse fields of research. This method helps to evaluate those outputs which are quite recent and not amenable to citation analysis. For the purpose of analysis, impact factor of journals in which papers are published are considered. A method for normalisation of impact factor of journals has been described and, normalised impact factors have also been used for the purpose of analysis. It is found that in such analysis normalised impact factor tends to show better results compared to simple impact factor. The analysis helps us to generate numerous performance indicators such as average impact factor and normalised impact factor for each laboratory and the research complex such as CSIR as a whole, average impact factor and normalised impact factor for each scientist of a laboratory and the research complex, spectral distribution of papers falling within various ranges of impact factors and normalised impact factors. By comparing the performances over several years the trend of research activity of each laboratory can also be obtained.

Keywords: Analysis, Citation, Citation Analysis, Evaluation, Impact Factor, Impact Factors, Indicators, Journals, Papers, Research, Scientific Output

? De Arenas, J.L. (1992), Partial assessment of Mexican health sciences research 1982-1986. *Scientometrics*, **23** (1), 47-56.

Full Text: [1992\Scientometrics23, 47.pdf](1992/Scientometrics23,%2047.pdf)

Abstract: The paper provides a picture of Mexican health sciences research for the years 1982-1986, measuring, bibliometrically, the size of its scientific activity. The most widely bibliometric indicators for research evaluation, publication count and citation analysis, are combined to determine the degree of production, productivity, and impact. The study also highlights the role of leading research institutions.

Keywords: Analysis, Basic Research, Bibliometric, Bibliometric Indicators, Citation, Citation Analysis, Citation Impact, Countries, Evaluation, Health, Health Sciences, Indicators, Institutions, Publication, Publication Output, Research, Research Evaluation, Sciences, Size

? Gaillard, J. (1992), Use of publication lists to study scientific production and strategies of scientists in developing-countries. *Scientometrics*, **23** (1), 57-73.

Full Text: [1992\Scientometrics23, 57.pdf](1992/Scientometrics23,%2057.pdf)

Abstract: A bibliometric study using the lists of publications and work of 207 scientists working in Asia, Latin America and Africa was conducted. Number of authored and co-authored articles published in scientific journals and bulletins, conference papers, books, chapters of books, reports were taken into consideration to measure the total scientific output. Local vs. international production was also determined by scientific fields, geographic areas, sexe and language of publication. Co-authorship studies were also used to particularly measure the degree of collaboration and dependence of Developing Countries’ (DC) scientists on foreign co-authors. An analysis of the references used (age, origins) was also made. Conclusions drawn concern the comparatively specific nature of science produces by DC’s researcher. Partly given the importance of the scientific production published in local journals, the inadequacy of international databases to study Dc science is confirmed. Most of the DC scientists publish in both national and international journals. They often cite their colleagues from the developed countries but their own work being less “visible” is seldom cited.

Keywords: Analysis, Asia, Bibliometric, Bibliometric Study, Co-Authors, Co-Authorship, Collaboration, India, International, Journals, Latin America, Mainstream Science, Papers, Publication, Publications, Science, Scientific Journals, Scientific Output, Scientific Production, Work, World

? Delgado, H. and Russell, J.M. (1992), Impact of studies published in the international literature by scientists at the National-University-of-Mexico. *Scientometrics*, **23** (1), 75-90.

Full Text: [1992\Scientometrics23, 75.pdf](1992/Scientometrics23,%2075.pdf)

Abstract: A total of 2192 articles published in the international literature with UNAM (National University of Mexico) first author affiliation and registered by the CICH (Centro de Iformacion Cientifica y Humanistica) BIBLAT database from 1978 - mid-1987 were included in our analysis. Distribution of articles according to the main subject areas of the 692 different journal titles used was as follows: Physics 24.1%, Medicine 19.7%, Biology 19.4%, Chemistry 9.7%, Engineering 8.9%, Exact Sciences 7.3%, Geosciences 4.7%, Psychology 0.96%, Agrosciences 0.27%. Thirty-seven percent of articles were published in journals with a known impact factor for 1987 of less-than-or-equal-to 1, 46.1% (920) in journals within the range of > 1-3 average citations/article and only 16.4% (327) in those titles with a factor > 3. Fifty-four percent (1082) of studies appeared in journals whose total citation count for 1987 was less-than-or-equal-to 5000, 7.3% (146) in journals cited > 50,000 times in that same year. UNAM scientists therefore as a group tend to publish in journals whose articles are not frequently cited in subsequent publications thus limiting their impact and visibility in the international scientific literature.

Keywords: Affiliation, Analysis, Citation, Database, First, Impact Factor, Indicators, International, Journal, Journals, Literature, Mainstream, Mexico, Publication, Publications

? Rabinovich, J.E. (1992), Publications of scientists of developing-countries in international journals - are they channels to the international circuit for colleagues that only publish in national journals - a case-study from the field of ecology in Argentina. *Scientometrics*, **23** (1), 91-103

Full Text: [1992\Scientometrics23, 91.pdf](1992/Scientometrics23,%2091.pdf)

Keywords: Argentina, Facts, Impressions, Science, Technology

Notes: UUniversity

Krauskopf, M. (1992), Scientometric indicators as a means to assess the performance of state supported universities in developing countries: The Chilean case. *Scientometrics*, **23** (1), 105-121.

Full Text: [1992\Scientometrics23, 105.pdf](1992/Scientometrics23,%20105.pdf)

Abstract: Chilean universities are responsible for more than 80% of the science produced in the country, which in the last 20 years with some periods of great difficulties, has grown more than 600%.

One of the underlying problems of the governments of developing countries to delineate suitable strategies to allocate efficiently the few funds available, has been the absence of clarity to distinguish the individuals and centers committed with competitive scientific research. As a consequence, the state funds, which in part are scarce because the region invest to little in science, do not always reach to the right people and to the right places, amplifying the already existing problems for the good scientists that resist to emigrate.

To evaluate the corresponding situation in Chile, and to follow the results of substantial actions to support the scientific activity in the country, we have examined the performance of state financed universities.

Keywords: Chile, Facts, Figures, Latin-America, Life Sciences, Newest Version, Physics, Publication Output, Relative Citation Impact, Research, Right, Science, Scientific Research, The Good, Universities

? Maciaschapula, C.A. (1992), Patterns of scientific communication among Latin-American countries, in the field of medical-education. *Scientometrics*, **23** (1), 123-135.

Full Text: [1992\Scientometrics23, 123.pdf](1992/Scientometrics23,%20123.pdf)

Abstract: This work reports on the medical subject headings that build-up the medical education field in Latin America, through the content and citation analysis of Educacion Medica y Salud (EMS). An attempt was made to establish the articulations between the citing and cited countries in the region. It was generally found that EMS was built-up by subjects of Medical Education, Health Manpower, Water Supply, and Health Policy. Although strongly citing/cited/indexed countries, Brazil, Mexico, and Colombia have not established significant information flows among them. Further research lines are proposed.

Keywords: Analysis, Brazil, Citation, Citation Analysis, Colombia, Education, EMS, Information, Latin America, Medical, Medical Education, Mexico, Research, Work

? Fernandez, M.T., Agis, A., Martin, A., Cabrero, A. and Gomez, I. (1992), Cooperative research projects between the Spanish-National-Research-Council and Latin-American institutions. *Scientometrics*, **23** (1), 137-148.

Full Text: [1992\Scientometrics23, 137.pdf](1992/Scientometrics23,%20137.pdf)

Abstract: Research projects in cooperation between Spanish National Research Council and Latin-American Organizations, that have been developed in the last eight years, were studied. Around forty Spanish research institutes have cooperated with Latin-American ones, mostly with Cuba, Chile, Brazil and Mexico. The interpretation of the collaboration rates with the different countries is discussed. Duration of the projects, number of researchers and research output were examined. The cooperation results were quantified through articles, presentations to congresses, reports, monographs, patents and thesis. Diffusion, languages and impact of the journals used for publication were studied. Non quantifiable outputs were also examined.

Keywords: Brazil, Chile, Collaboration, Cooperation, Journals, Languages, Mexico, Patents, Publication, Research

Thomas, S.M. (1992), The evaluation of plant biomass research: A case-study of the problems inherent in bibliometric indicators. *Scientometrics*, **23** (1), 149-167.

Full Text: [1992\Scientometrics23, 149.pdf](1992/Scientometrics23,%20149.pdf)

Abstract: The aim of this project was to evaluate research groups working in the broad field of plant biomass in the areas outside the USA and the EC. The assessment had two key elements: the measurement of scientific productivity and the investigation of factors affecting research performance. Research groups were identified from a range of information sources. Data on funding, information access, staffing, publication policy and degree of awareness of other research groups in the field were collected during the course of interviews. Two approaches - bibliometric analysis and peer review - were examined as a means of constructing indicators for assessing research output. Following a critical review of the use of bibliometric indicators in peripheral countries, the results from a study of eight countries are presented. Neither of two indicators employed proved to be a particularly successful method of evaluating research, and this finding is discussed in relation to publication patterns, the nature of the research community and the research field under study. Finally, the use of a ‘peripatetic expert’ was found to have some value as a means of assessment.

Keywords: Access, Analysis, Assessment, Beholder, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Biomass, Citation, Community, Course, Developed-Countries, EC, Indicators, Information, Interviews, Investigation, Measurement, Peer Review, Peer-Review, Performance, Plant, Policy, Publication, Research, Research Performance, Review, Science, Scientific Activity, USA

? Roseboom, J. and Pardey, P.G. (1992), Measuring the development of national agricultural-research systems. *Scientometrics*, **23** (1), 169-190.

Full Text: [1992\Scientometrics23, 169.pdf](1992/Scientometrics23,%20169.pdf)

Abstract: Starting in 1986, a small team at ISNAR has been working to establish a global database on national agricultural research systems. This paper provides an overview of the conceptual and practical difficulties of measuring the capacity of national agricultural research systems. Special attention is given to alternative procedures to translate research expenditures expressed in current local currency units into a constant common numeraire. The paper closes with a preliminary assessment of the development of national agricultural research systems over the period 1961-65 to 1981-85.

Keywords: Alternative, Assessment, Capacity, Database, Development, Procedures, Research, Small

Adamson, I. (1992), Access and retrieval of information as coordinates of scientific development and achievement in Nigeria. *Scientometrics*, **23** (1), 191-199.

Full Text: [1992\Scientometrics23, 191.pdf](1992/Scientometrics23,%20191.pdf)

Abstract: In the pioneering study on the quantitation of science in the first generation Nigerian Universities between 1975-79 using the scientific indicator of publication count of publishing scientists derived from ISI database, the data showed a real growth in scientific output. The growth correlated well with Federal Government funding of the Universities and the nation’s Gross Domestic Product (GDP). The decline and often erratic funding stemmed the rate of growth in most of the Universities. In spite of the modest growth recorded for the fastest growing science of Biochemistry, where nutrition was identified as the major front of research, high infant morality rate (an index of under-development) was unabated. Retrieval of information to aid prosecution of relevant research and lack of access to scientific information have resulted in intellectual isolation of Nigerian scientists and inapplicability of research findings. Apart from India, the pathetic state of scientific growth and relevance in Nigeria is typical of the Developing Countries (DC). The situation calls for awareness of the importance of science indicators in strengthening the coverage of third world science and for support of science in the DC. Refining of science indicators for suitability to measuring science in these countries is also advocated.

Keywords: Access, Countries, Database, First, Generation, Growth, India, Indicator, Indicators, Infant, Information, ISI, Morality, Nigeria, Nutrition, Publication, Publishing, Relevance, Research, Science, Science Indicators, Scientific Information, Scientific Output

? Whitney, G. (1992), Access to third-world science in international scientific and technical bibliographic databases. *Scientometrics*, **23** (1), 201-219.

Full Text: [1992\Scientometrics23, 201.pdf](1992/Scientometrics23,%20201.pdf)

Abstract: For the past eight years, the author has been examining trends in access to international scientific literature in major international bibliographic databases available on various information systems. A major portion of the research program examined and compared the languages of documents and countries of publication for items published between 1970-1990 and recorded on MEDLINE, PsycInfo, BIOSIS, Chemical Abstracts, and other databases on the DIALOG system. The second phase of this study examine the remaining scientific databases on DIALOG, including MATHFILE and AGRICOLA. A comparison of the international range of MEDLINE and EMBASE has also recently been completed. In order to attempt to assess actual amounts of literature produced, the Unesco statistics for literature production have been studied. In the course of this research, the author encountered a variety of system attributes that affect the ways in which Third World science can be identified. Some of the policies and procedures of database development that affect the inclusion of Third World science have been identified.

Keywords: Access, Comparison, Course, Database, Development, Information, Information Systems, International, Languages, Literature, MEDLINE, Procedures, Publication, Research, Science, Statistics, Trends

? Sancho, R. (1992), Misjudgments and shortcomings in the measurement of scientific activities in less-developed-countries. *Scientometrics*, **23** (1), 221-233.

Full Text: [1992\Scientometrics23, 221.pdf](1992/Scientometrics23,%20221.pdf)

Abstract: The bibliographic database widely used for measurement of scientific production either for developed or developing countries is Science Citation Index. So then, in the case of LDCs only their negligible contribution to the “mainstream” of science is evaluated. Eight LDCs productivity as obtained from SCI is compared to that from some international specialized or multidisciplinary databases, most of which give more information than SCI for each country. In the case of Cuba, BIOSIS and CA supply 17 and 15 times respectively more information than the SCI in the same period. The use of Cuban local database and its comparison with international ones is also discussed.

Keywords: Citation, Comparison, Database, Indicators, Information, International, Latin-America, Mainstream, Measurement, Multidisciplinary, Output, Periphery, SCI, Science, Science Citation Index, Scientific Production

? Chatelin, Y. and Arvanitis, R. (1992), Representing scientific activity by structural indicators - the Case of Cote-Divoire 1884-1968. *Scientometrics*, **23** (1), 235-247.

Full Text: [1992\Scientometrics23, 235.pdf](1992/Scientometrics23,%20235.pdf)

Abstract: Eight different indicators are calculated on the basis of an extensive bibliography on science in Cote d’Ivoire, and presented by scientific domain in polar graphs. They permit to have a synthetic image of scientific activity and distinguish different scientific styles. Moreover the notion of “colonial science” is re-evaluated, and a case is made in order to distinguish between different ways of doing science. The indicators and graphic representation proposed here may be a valid method to identify differing patterns at a glance.

Keywords: Citation, Indicators, Representation, Science

El Alami, J., Dore, J.C. and Miquel, J.F. (1992), International scientific collaboration in Arab countries. *Scientometrics*, **23** (1), 249-263.

Full Text: [1992\Scientometrics23, 249.pdf](1992/Scientometrics23,%20249.pdf)

Abstract: Through internationally coauthored scientific articles in the Science Citation Index data base, we analyse international collaboration of some Arab countries in science. Our findings show that international collaboration of these countries is concentrated on engineering & technology and fundamental & applied biology. Collaboration is often established through doctoral studies and the links thus created continue. Cultural and historical traditions play an important role in collaboration. We compare the SCI data base with a local survey of chemists in Morocco and discuss some of the limits of bibliometric methods.

Keywords: Bibliometric, Bibliometric Methods, Biology, Collaboration, Data Base, International, Methods, Morocco, SCI, Science, Science Citation Index, Survey, Technology

Notes: UUniversity

Roche, M. and Freites, Y. (1992), Rise and twilight of the Venezuelan scientific community. *Scientometrics*, **23** (2), 267-289.

Full Text: [1992\Scientometrics23, 267.pdf](1992/Scientometrics23,%20267.pdf)

Abstract: By the end of the seventies, there was in Venezuela a solidly entrenched scientific community. Scientists were mostly full time, satisfied or very satisfied with their work, relatively well paid and with adequate facilities to do research. Beginning in 1982, when a process of inflation and devaluation started in the country as a whole, there has been a twilight of the scientific community, leading to migration of scientists abroad or to industry. The Government has announced drastic measures to bring up the budget for science and technology from 0.3 to 2.0% of gross national product. If these measures are indeed implemented, there will be a dawn without having to go through a long night.

Keywords: Budget, Community, Facilities, Facts, Figures, Newest Version, Physics, Publication Output, Relative Citation Impact, Research, Science, Science and Technology, Technology, Work

? Sen, B.K. and Lakshmi, V.V. (1992), Indian periodicals in the Science-Citation-Index. *Scientometrics*, **23** (2), 291-318.

Full Text: [1992\Scientometrics23, 291.pdf](1992/Scientometrics23,%20291.pdf)

Abstract: The coverage of Indian S&T periodicals in SCI has been studied covering the period 1975-88. The study shows that coverage is rather poor due to a variety of reasons. Many of the Indian periodicals do not fulfil the criteria for getting covered in SCI. About 500 periodicals have been identified which are covered by at least one major indexing or abstracting service of the world. Total number of such periodicals is likely to be over 600. Slight improvement in the standard of these periodicals is likely to make many of them worthy of coverage by SCI.

Keywords: Criteria, Periodicals, SCI, Science Citation Index, Scientific Journals, Standard

? Todorov, R. (1992), Displaying content of scientific journals - A co-heading analysis. *Scientometrics*, **23** (2), 319-334.

Full Text: [1992\Scientometrics23, 319.pdf](1992/Scientometrics23,%20319.pdf)

Abstract: A co-heading analysis is proposed for representing the subject content of scientific journals. It is based on the subject headings assigned to documents before their input in bibliographic databases. The method utilizes specifically the co-appearance of headings in the document records to display the subject scope of a given journal not only by the topics covered but by their relationships as well. This analysis is applied in superconductivity for displaying the content of some physics journals using data from 1984 Physics Abstracts. The results (in the form of inclusion maps) could help information scientists and library staff in evaluating and selecting appropriate journals.

Keywords: Analysis, Information, Journal, Journals, Records, Scientific Journals, Selection

? Haitun, S.D. (1992), The problem of indicator-latent relationship in metric models. 1. statement and general-solution. *Scientometrics*, **23** (2), 335-351.

Full Text: [1992\Scientometrics23, 335.pdf](1992/Scientometrics23,%20335.pdf)

Abstract: Metric models, i.e. formalisms describing relationships between indicators and latent variables, are discussed. In modern metric models, a latent is regarded as independent of the measuring person. It is suggested that this defect of metric models be avoided if the latent is assignment a priori by fixing a form of latent distribution.

Keywords: Indicators, Models, Person, Scientific Activities, Variables

? Barre, R. (1992), Correction. *Scientometrics*, **23** (2), 353.

Full Text: [1992\Scientometrics23, 353.pdf](1992/Scientometrics23,%20353.pdf)

? Keay, C.S.L. (1992), Physics, psychology and respectability. *Scientometrics*, **23** (3), 355-359.

Full Text: [1992\Scientometrics23, 355.pdf](1992/Scientometrics23,%20355.pdf)

Abstract: Opportunities for obtaining a quantitative measure of respectability for ideas in the physical sciences appear to be rather infrequent. A unique set of statistics is presented which demonstrates the respectability gained when a centuries-old psychological rationalisation for a rare natural phenomenon is replaced by a viable physical explanation.

Keywords: Explanation, Physical Sciences, Sciences, Statistics

? Granovsky, Y.V., Luibimova, T.N., Murashova, T.I. and Myatlev, V.D. (1992), Information-based evaluation of the quality of doctoral theses. *Scientometrics*, **23** (3), 361-376.

Full Text: [1992\Scientometrics23, 361.pdf](1992/Scientometrics23,%20361.pdf)

Abstract: A method of information-based evaluation of the quality of doctoral theses has been worked out. It is based on a multidimensional classification system which includes: a list of attributes to characterize the given theses and their authors, singling out the most significant attributes, calculating a complex criterion showing the quality of a thesis on the basis of a series of significant attributes, ranging the theses according to this criterion. This method was used to evaluate 36 doctoral theses in chemistry according to 41 attributes considered. Four main attributes were singled out. Based on them a complex quality criterion which we termed the originality index was calculated. The values of the originality index of these theses differed by an order of magnitude. Two attributes affecting the index of originality were singled out: the place where the thesis was prepared, and the fact whether the author had any papers published in non-Academy journals (journals not published by the USSR Academy of Sciences).

Keywords: Chemistry, Classification, Evaluation, Journals, Papers, Quality

? Jaschek, C. (1992), The visibility of West European astronomical research. *Scientometrics*, **23** (3), 377-393.

Full Text: [1992\Scientometrics23, 377.pdf](1992/Scientometrics23,%20377.pdf)

Abstract: Publications and citations of five West European astronomical communities (Switzerland, Sweden, GFR, France and Spain) are compared. A large proportion of astronomers are sparsely cited or not cited at all, a fact which shows that estimations of the number of scientists based upon citation statistics are underestimates. It is found that publication rates are similar but citation rates very dissimilar in the five countries. No clear explanation of these differences is found, except for Spain. A plea is made to use citation statistics rather than publication statistics for evaluation.

Keywords: Citation, Citations, Evaluation, Explanation, France, Publication, Science, Spain, Statistics, Switzerland

? Jain, A. and Garg, K.C. (1992), Laser research in India - Scientometric study and model projections. *Scientometrics*, **23** (3), 395-415.

Full Text: [1992\Scientometrics23, 395.pdf](1992/Scientometrics23,%20395.pdf)

Abstract: An analysis of 785 papers, books and reports, in the field of laser, published from India during 1967-84, indicates that Indian output comprises almost 1% of the international output. The total output came from 77 academic and research institutions, out of which 10 institutions contributed almost 23%. Major portion of these publications appeared in foreign journals of repute, as reflected by their impact factors. Emphasis has been on theoretical aspects of laser research. The laser research performed in India appears to be a part of mainstream science as indicated by the pattern of publications and citations. The study also indicates that Indian scientists have few international collaboration in this field. A mathematical model for growth of literature output shows that though the rate of Indian literature output peaked at about the same time as that of the world output, Indian output may start getting marginalised by 1995. The model indicates that reasons for this lie in relatively less emphasis in India on experimental and applied aspects of laser research compared to international averages.

Keywords: Analysis, Bibliometric Analysis, Citations, Collaboration, Experimental, Growth, Impact Factors, India, Institutions, International, Israel, Journals, Literature, Mathematical Model, Model, Papers, Pattern of Publications, Performance, Publications, Research, Science, Superconductivity

? Law, J. and Whittaker, J. (1992), Mapping acidification research - A test of the co-word method. *Scientometrics*, **23** (3), 417-461.

Full Text: [1992\Scientometrics23, 417.pdf](1992/Scientometrics23,%20417.pdf)

Abstract: This paper extends the co-word method for mapping science, adopting new statistical and graphical methods to explore time-series data and the changing distribution of effort between different research themes. It also tests the reliability of the co-word method, comparing co-word data on the acidification of the environment with data derived from a large scale interview study. Overall, the study increases our confidence in the reliability of the co-word method. In particular, it leads us to the following conclusions: (a) that the PASCAL database is representative, at least in the area of acidification research, (b) that indexer bias is negligible, and (c) that the co-word method satisfactorily identifies groups of research themes and the way in which these evolve.

Keywords: Bias, Confidence, Database, Environment, Methods, Reliability, Research, Science

? Rubio, A.V. (1992), Scientific production of Spanish universities in the fields of social-sciences and language. *Scientometrics*, **24** (1), 3-19.

Full Text: [1992\Scientometrics24, 3.pdf](1992/Scientometrics24,%203.pdf)

Abstract: This article reviews the scientific production of the Spanish universities in the areas of Social Sciences and Language Sciences during the period 1986-1988. A series of quantitative criteria are being applied to the submission of data on total scientific production, productivity rate, publications/authors ratio, coauthorship, type of documents edited and their distribution, all of them broken down per university. Last but not least, a review is made of the distribution by subjects of each publication. The results obtained underline the increasing rate of production achieved in the three-year period, a certain stagnation in the number of authors and in team research activities, a far too endogamic diffusion in periodical publications and a somewhat unbalanced thematic diversification as compared to the geographical and cultural variety of our country. The article concludes by suggesting new lines of study for determining the factors that may explain the existing patterns of scientific production, and for identifying useful bibliometric measures aiming at an assessment of this type of literature.

Keywords: Assessment, Bibliometric, Coauthorship, Criteria, Cultural, Diffusion, Humanities, Literature, Periodical, Publication, Publications, Research, Review, Scientific Production, Universities, University

? Ortega, C., Plaza, L.M., Martin, M.J. and Urdin, M.C. (1992), Spanish scientific and technical journals - state-of-the-art. *Scientometrics*, **24** (1), 21-42.

Full Text: [1992\Scientometrics24, 21.pdf](1992/Scientometrics24,%2021.pdf)

Abstract: This article analyses the current situation in the field of scientific and technical journals published in Spain, by determining the following scientific indicators for each: 1: Specifications. 11: Scientific production covered. III: Visibility and accessibility. The first section provides a qualitative and quantitative study of the journals, asking what subjects they cover, who publishes them, how often they are published, how up to date they are and whether the way they are presented meets international publishing standards. The second section analyses scientific production by research sectors and the percentage of articles collected in the ICYT database compared with the total number of papers published in the journals studied. It also studies the reference habits of the authors published therein to identify whether the literature referred to is of local origin or international. Finally, the third section deduces these journals’ degree of visibility by analysing how they are distributed amongst the usual media, i.e. international periodicals directories and databases, and how efficiently they work as vehicles for the diffusion of research by foreign authors. The study covers 10 years (1980-1989), thus enabling to recognise past and current trends in Spanish scientific literature.

Keywords: Country, Database, Diffusion, First, Flow, Indicators, Information, International, Journals, Literature, Mainstream, Media, Origin, Papers, Periodicals, Publishing, Qualitative, Research, Science, Scientific Production, Spain, Standards, Trends, Work

? Cano, F. and Julian, S. (1992), Some indicators in Spanish scientific production. *Scientometrics*, **24** (1), 43-59.

Full Text: [1992\Scientometrics24, 43.pdf](1992/Scientometrics24,%2043.pdf)

Abstract: This is an analysis of the scientific production of the Spanish research community compiled by the Institute for Scientific Information (ISI) during the period 1983-1989 through indicators of publications (scientific output) that have been accepted, more and more frequently, as tools for decision-making. The percentages of the total number of articles per year are defined and the temporal evolution is shown of the orders of quality of the hypothetical journals that represent the whole production. A new indicator is used for comparisons between scientific subjects and thematic areas. Finally, mention is made of the spectacular growth of the Spanish scientific production in the period referred to, not only in quantity but also in quality through the indicators considered.

Keywords: Analysis, Community, Decision Making, Decision-Making, Evolution, Growth, Indicator, Indicators, Institute For Scientific Information, ISI, Journals, Publications, Quality, Research, Scientific Output, Scientific Production

? Mendez, A. and Salvador, P. (1992), The application of scientometric indicators to the-Spanish-scientific-research-council. *Scientometrics*, **24** (1), 61-78.

Full Text: [1992\Scientometrics24, 61.pdf](1992/Scientometrics24,%2061.pdf)

Abstract: The assessment of the research performance of the Spanish Scientific Research Council using scientometric indicators was done. Number of scientists and budget involved in research projects were used as input measures while articles published in foreign journals, patent applications and citations received provided output figures. The time period studied was 1984-1987. Target of the analysis were wide research areas and the research Institutes included in them. The obtained results point out that very often costs, productivity and impact do not go in the same direction. Most likely, other activities no measurable by scientometric indicators may have played an important role in some Institutes. Besides, the presence of highly cited articles at Institutes with low productivity scores indicates not correspondence of quantity with impact. It is suggested that the research group level would be a more reliable unit for analysis than the aggregated level of Institute or research area.

Keywords: Analysis, Assessment, Budget, Citations, Costs, Indicators, Journals, Patent, Research, Research Performance, Scientometric

? Blasco, P.G. (1992), Socioeconomic indicators on research-and-development in Spain. *Scientometrics*, **24** (1), 79-93.

Full Text: [1992\Scientometrics24, 79.pdf](1992/Scientometrics24,%2079.pdf)

Abstract: This essay analyses some aspects of the situation of scientific policy in Spain, mainly from a socio-economic point of view. The funds dedicated to R and D, its sources, evolution by years and distribution in relation with the GNP and different sectors such as public institutions and private enterprises are studied, as well as the relations of those funds with the inhabitants of the country and with the number of scientific researchers, the areas of research and the percentages dedicated to applied research and to development. In a similar way personnel engaged in R and D, their number, types of researchers, centers and scientific areas of research are presented.

Keywords: Development, Enterprises, Evolution, Institutions, Personnel, Policy, Relations, Research, Scientific Policy, Spain

? Pestana, A. (1992), Spanish performance in life sciences - A comparative appraisal of the scientific production of Spain and 5 other European countries in 1989. *Scientometrics*, **24** (1), 95-114.

Full Text: [1992\Scientometrics24, 95.pdf](1992/Scientometrics24,%2095.pdf)

Abstract: The output in life science disciplines from Spain and five other European countries has been measured in a datafile derived from the Current Contents-Life Sciences on diskette (1989). The results of this flash evaluation were contrasted with data retrieved from a survey covering the yearly output during the 1973-83 period and thee 1981-85 aggregated value from Schubert, Glänzel, Braun datafiles. The results of these studies showed an increasing share of Spain in the six countries’ output, especially in the subfields of organic chemistry and phytochemistry. However, the quality of the Spanish articles - as deduced from the journal impact factors (JRC - 1989) - is below the six countries average- The usefulness of the Current Contents on diskette for handy and reliable flash evaluations has been ascertained through a comparative analysis with more comprehensive surveys.

Keywords: Analysis, Chemistry, Evaluation, Impact Factors, Journal, Journal Impact, Journal Impact Factors, Life, Quality, Science, Spain, Survey

Sancho, R., Pastor, A. and Criado, E. (1992), Bibliometric approach to research performance in the field of refractory materials used in iron and steelmaking processes. *Scientometrics*, **24** (1), 115-136.

Full Text: [1992\Scientometrics24, 115.pdf](1992/Scientometrics24,%20115.pdf)

Abstract: A bibliometric study based on worldwide scientific and technical publications on refractory materials used in iron and steelmaking processes during 1980-87, has been carried out. Six bibliographic databases were searched and from them 2464 references were retrieved. The highest percentage of published documents were journal articles (60%), followed by patents (33%). The core journals are Ogneupory (USSR) and Taikabutsu (Japan). The USSR was by far the most productive country, both in number of published papers and in number of journal titles devoted to the subject. In The Soviet Union research work is mainly carried out in universities and institutes of the Academy of Sciences. On the other hand, Japan is the most productive country in patent registered, and research work is carried out there either in private refractory companies or in steelmaking enterprises. The trend in worldwide research points towards shaped refractories, particularly based in high alumina, magnesia, zircon carbides and mixtures containing oxides and carbon, which are largely used in converters, transport ladles and continuous casting processes

Keywords: Alumina, Bibliometric, Bibliometric Study, Carbon, Enterprises, Iron, Japan, Journal, Journal Articles, Journals, Magnesia, Oxides, Papers, Patent, Patents, Publications, Research, Research Work, Transport, Universities, Work

? Mendez, A. and Gomez, I. (1992), Collaborative research in Spain in the field of pharmacy and pharmacology. *Scientometrics*, **24** (1), 137-147.

Full Text: [1992\Scientometrics24, 137.pdf](1992/Scientometrics24,%20137.pdf)

Abstract: Collaborative research in Spain in the field of pharmacology is studied. Co-authored papers in periodicals were one of the indicators used to quantify collaborative research results. Through Spanish publications of pharmacologists, collaborations between different institutions in the same city are mostly detected. Through foreign papers quite different networks were found, both amongst Spanish cities and with institutions in other countries. In case of Spanish pharmaceutical industry questionnaires were used to determine their links with other institutions, mostly through research projects.

Keywords: Collaborative Research, Indicators, Institutions, Papers, Periodicals, Pharmaceutical Industry, Publications, Questionnaires, Research, Spain

? Ferreiro, L. and Ugena, S. (1992), Citation mechanics in journals covered by the journal citation reports. *Scientometrics*, **24** (1), 149-162.

Full Text: [1992\Scientometrics24, 149.pdf](1992/Scientometrics24,%20149.pdf)

Abstract: Citations from 1980 to 1988, obtained from fifty biomedical journals covered by the Journal Citation Reports (JCR) are studied. In purely numerical terms, the evolution of each citation (journal citation), including its impact factor (IF), would depend essentially on three variables for each journal: (i) the yearly rate of increase of items that could be cited (citable items), (II) the relative yearly increment of the citing journals, (iii) the relative yearly increment of citations. The mechanics of this give rise to the three standard patterns for journal citations, namely. (i) annual impact factor’s increase each year (ascending evolution), (II) annual impact factors remain the same each year (constant evolution), (iii) annual impact factors decrease each year (descending evolution). The reason why some journal citation profiles do not fit into the standard patterns is presumably that forces are at work able to alter the numerical mechanics described. The concepts of saturation/unsaturation of the demand for scientific information are introduced, showing how they are reflected in the impact factor figures for the journals cited.

Keywords: Biomedical, Biomedical Journals, Citation, Citations, Demand, Evolution, Impact, Impact Factor, Impact Factors, Indicators, Information, Journal, Journal Citation Reports, Journal Citations, Journals, Scientific Information, Standard, Work

Notes: TTopic

Bordons, M., García-Jover, F. and Barrigon, S. (1992), Bibliometric analysis of publications of Spanish pharmacologists in the SCI (1984-89). 1. Contribution to the pharmacology and pharmacy subfield (ISI). *Scientometrics*, **24** (1), 163-177.

Full Text: [1992\Scientometrics24, 163.pdf](1992/Scientometrics24,%20163.pdf)

Abstract: The present study is a bibliometric analysis of publications of Spanish pharmacologists, referenced in the journals of the Pharmacology & Pharmacy subfield of the Science Citation Index- CD Edition from 1984 to 1989. During this time the scientific output of Spanish pharmacologists has been growing at an impressive rate being almost doubled. This rate being notably greater than that corresponding to publications of Spain in all science fields. This increase in scientific output was accompanied by a time-dependent decrease on year by year step basis in the expected impact factor (EIF) of publications (Articles plus Notes), from 1.71 in 1984 to 1.28 in 1989, in close correlation with an increase of mean number of authors per paper, from 3.67 to 4.16 authors/paper, respectively. Moreover, the larger the number of authors/paper, the smaller the EIF. Only 8 journals cumulated more than 50% of the papers. The scientific production was geographically localized at a high extent (Barcelona, Madrid, Valencia accounted for the 63.7% of all the papers) in governmental institutions (University, 75.2%, Hospitals, 14.1%, CSIC, 10.5%) with one large geographical area lacking any productivity.

Keywords: Analysis, Basic Science, Bibliometric, Bibliometric Analysis, CD, Impact Factor, Institutions, Journals, Papers, Publications, Science, Science Citation Index, Scientific Output, Scientific Production, Spain

? Pao, M.L. (1992), Correction. *Scientometrics*, **24** (1), 179.

Full Text: [1992\Scientometrics24, 179.pdf](1992/Scientometrics24,%20179.pdf)

? Braun, T., Gomez, I., Mendez, A. and Schubert, A. (1992), International coauthorship patterns in physics and its subfields, 1981-1985. *Scientometrics*, **24** (2), 181-200

Full Text: [1992\Scientometrics24, 181.pdf](1992/Scientometrics24,%20181.pdf)

Keywords: Scientific Collaboration

? Rousseau, R. and Zhang, Q.Q. (1992), Zipf data on the frequency of Chinese words revisited. *Scientometrics*, **24** (2), 201-220.

Full Text: [1992\Scientometrics24, 201.pdf](1992/Scientometrics24,%20201.pdf)

Abstract: At the occasion of the 40th anniversary of George Zipf’s premature dead, we reanalyse his data on the frequency of Chinese words. We find the best fitting Lotka, Zipf, Bradford and Leimkuhler distribution and show that only Lotka’s function is not rejected by a Kolmogorov-Smirnov test. Using an additional term to Leimkuhler’s function leads to a statistically acceptable fit. In this way we can determine a core (nucleus) of most frequently used Chinese words.

Keywords: Chinese, Function, Law, Lotka, Zipf

? Haitun, S.D. (1992), The problem of indicator-latent relationship in metric models. 2. metric models with a priori latent assignment. *Scientometrics*, **24** (2), 221-235.

Full Text: [1992\Scientometrics24, 221.pdf](1992/Scientometrics24,%20221.pdf)

Abstract: Metric models in which indicator distribution and a priori assigned latent distributions coincide in form are developed.

Keywords: Indicator, Models, Non-Additivity, Quantitative-Analysis, Scientific Activities, Stationary Scientometric Distributions

? Hall, D.H. (1992), The science-industry interface - Correlation of time-series of indicators and their spectra, and growth-models in the nuclear-fuels industry. *Scientometrics*, **24** (2), 237-280.

Full Text: [1992\Scientometrics24, 237.pdf](1992/Scientometrics24,%20237.pdf)

Abstract: This paper is the third in a series on the flows of influence at the interface between geoscience research and the exploration for and mining of nuclear fuels. It deals with the application of signal processing methods to research and industry indicators, with emphasis on time and frequency domain correlations and lap, and on growth modelling of the indicators using the special and general logistic models. The findings include the following: there was a strong interchange across the science-industry interface, quantitative methods. can establish the degree of correlation and the time periods in which these correlations mainly reside, also the timing of decisions to initiate exploration and research can be specified in this cue. A strategy of applying quantitative methods, history of science, and periodic analyses of the state of the industry to studies of science policy is suggested by this research.

Keywords: Correlations, Geoscience, Growth, History, History of Science, Indicators, Methods, Mining, Modelling, Models, Policy, Quantitative Methods, Research, Science, Science Policy

? Lemoine, W. (1992), Productivity patterns of men and women scientists in Venezuela. *Scientometrics*, **24** (2), 281-295.

Full Text: [1992\Scientometrics24, 281.pdf](1992/Scientometrics24,%20281.pdf)

Abstract: This paper examines the applicability of Lotka’s formulation as a general inverse power (alpha not-equal 2) and as an inverse square power relationship (alpha = 2) to the distribution of the scientific output in Venezuela. The analysis takes into consideration the sex of the authors and the type of journal, mainstream or national, in which they publish their articles. The data were taken from the last census of scientist. and technologists carried out in 1983 by the Venezuelan government. A K-S and a t-test were applied to measure the degree of agreement between the distribution of the observed set of data against the inverse general power relationship (the former test) and the theoretical value of alpha = 2 (the latter). It was found that a general inverse power relationship only describes the productivity pattern of those Venezuelan women scientists who publish in foreign journals. An inverse square power relationship characterizes the distribution pattern for the data set of female authors in all journals and for scientists of both sexes whose contributions appeared in national journals. The values of alpha suggest that women am less productive than men except in national journals, and Lotka’s formulation seems to be useful as an indicator of inequality in male/female scientific productivity.

Keywords: Analysis, Female, Indicator, Inequality, Inverse Power, Journal, Journals, Lotkas Law, Men, Nigeria, Scientific Output, Sex, Women

? Luukkonen, T. (1992), Is scientists publishing behavior reward-seeking. *Scientometrics*, **24** (2), 297-319.

Full Text: [1992\Scientometrics24, 297.pdf](1992/Scientometrics24,%20297.pdf)

Abstract: The use of bibliometric indicators in research evaluation makes many hidden assumptions about scientists’ publishing habits. This paper tests an assumption that scientists am reward oriented and attempt to publish in as prestigious channels as possible, seeking an optimal level in the hierarchy of publications. The data am based on interviews with teaching and research personnel in four university departments in the fields of zoology, biomedicine, and automation and control technology. The author concludes that in all studied fields scientists placed equal emphasis on the reward and communication functions of publishing. The actual publishing behaviour of biomedical scientists, nevertheless, accorded best with the assumption of seeking an optimal level of publishing in terms of prestige. By contrast, in zoology and technical fields, local and field-related publishing habits appeared strong.

Keywords: Assumptions, Automation, Behaviour, Bibliometric, Bibliometric Indicators, Biomedical, Biomedicine, Communication, Evaluation, Functions, Indicators, Interviews, Personnel, Publications, Publishing, Research, Research Evaluation, Teaching, Technology, University

? Leydesdorff, L. (1992), Irreversibilities in science and technology networks - An empirical and analytical approach. *Scientometrics*, **24** (2), 321-357.

Full Text: [1992\Scientometrics24, 321.pdf](1992/Scientometrics24,%20321.pdf)

Abstract: The theory of autopoiesis, i.e., self-referentiality in the operation of the system, provides us with a production rule for change in the structure of the network. Using information theory, a model system is developed to study the relative likelihood of “dynamic” transitions: various senses of ‘irreversibility” (“emergence”, and “path dependency) are distinguished. A test for “path dependency” is applied to two sets of empirical data which supposedly reflect historical discontinuities: the budget of the Fraunhofer Gesellschaft, and the citation network among AIDS research related journals. The model for the interaction between self-referential developments and goal-referential boundary conditions is further specified, using the example of technological trajectories and selection environments.

Keywords: AID, AIDS, Budget, Citation, Citation Network, Count, Dependency, Indicators, Information, Interaction, Journals, Model, Network, One Might Wish, Research, Structure, Texts, Theory

? Garrison, H.H., Herman, S.S. and Lipton, J.A. (1992), Measuring characteristics of scientific-research - A comparison of bibliographic and survey data. *Scientometrics*, **24** (2), 359-370.

Full Text: [1992\Scientometrics24, 359.pdf](1992/Scientometrics24,%20359.pdf)

Abstract: Three characteristics of scientific research (subject matter, researchers’ institutional sectors, and funding sources) were compared using bibliographic and survey data from a study of restorative dental materials research. Both types of data yielded similar findings on the distribution of research across subject areas and the distribution of researchers in government, university and industry sectors. Findings on the sources of research funding, however, were dissimilar and university research support appeared underreported in the bibliographic data. In general, data on publications (from bibliographic files or surveys) yielded lower estimates of industrial participation in research than data pertaining to projects.

Keywords: Estimates, Productivity, Publications, Research, Research Funding, Research Support, Scientific Research, Survey, University

? Martin, B.R. (1992), Big history for big science - Critical-review of history of CERN - Hermann, A, Krige, J, Mersits, U, Pestre, D. *Scientometrics*, **24** (2), 371

Full Text: [1992\Scientometrics24, 371.pdf](1992/Scientometrics24,%20371.pdf)

? Narvaezberthelemot, N., Frigoletto, L.P. and Miquel, J.F. (1992), International scientific collaboration in Latin-America. *Scientometrics*, **24** (3), 373-392.

Full Text: [1992\Scientometrics24, 373.pdf](1992/Scientometrics24,%20373.pdf)

Abstract: This study attempts to analyse the usability of international databases such as the Science Citation Index (SCI) for the observation of the international collaboration in lesser-developed countries. We have examined the adequacy of this data source (the SCI) in perceiving the international scientific activities of nine Latin American countries. We have studied the relationships of these countries with their main foreign partners in the large fields of science. It has been observed that some of these relationships are not covered by the data source under study. The creation of an information system storing complementary data suited for the identification of existing international collaborative projects is recommended. In the long-range future such a system would provide more appropriate information for the analyses of international collaboration.

Keywords: Collaboration, Complementary, Identification, Information, International, Latin America, SCI, Science, Science Citation Index, Usability

Notes: UUniversity

Nederhof, A.J. and Noyons, E.C.M. (1992), Assessment of the international standing of university departments’ research: A comparison of bibliometric methods. *Scientometrics*, **24** (3), 393-404.

Full Text: [1992\Scientometrics24, 393.pdf](1992/Scientometrics24,%20393.pdf)

Abstract: Several bibliometric methods of assessing the research performance of departments are examined: intranational comparison of departments, comparison with foreign departments of good standing, and comparison with a bibliometric world average. In the study, two Dutch experimental psychology departments were compared with one good US and one outstanding UK department. The better of the Dutch departments performed below both foreign departments. However, using the method involving Journal Citation Scores, it was shown that this Dutch department scored above world average recently, while the other department consistently scored below world average. The best picture is obtained when both methods are combined, which shows that the better Dutch department is ranking in the sub-top of the world, while the other department performs below average

Keywords: Behavioral-Sciences, Bibliometric, Bibliometric Methods, British, Citation, Comparison, Experimental, Humanities, Indicators, Methods, Productivity, Psychology, Ranking, Research, Research Performance, UK, US

? Thomas, K.S. (1992), The development of eponymy - A case-study of the southern blot. *Scientometrics*, **24** (3), 405-417.

Full Text: [1992\Scientometrics24, 405.pdf](1992/Scientometrics24,%20405.pdf)

Abstract: Direct, indirect, and implicit citation to an eponymous paper is examined to determine the time span over which eponymy develops. The eponym of a very highly cited method paper was commonly used, indexed, and became a chapter title within 5 years after publication. It began to receive implicit citations within about 6 years, and within 14 years, the implicit citation rate exceeded 50%. Definitions of three forms of citation are given, and an empirical definition of eponymy is offered.

Keywords: Citation, Citations, Nitrocellulose, Publication

? Lancaster, F.W., Burger, R.H. and Rauchfuss, B.M. (1992), Use of literature by East European scientists - What influences place of publication of sources cited. *Scientometrics*, **24** (3), 419-439

Full Text: [1992\Scientometrics24, 419.pdf](1992/Scientometrics24,%20419.pdf)

Abt, H.A. (1992), Publication practices in various sciences. *Scientometrics*, **24** (3), 441-447.

Full Text: [1992\Scientometrics24, 441.pdf](1992/Scientometrics24,%20441.pdf)

Abstract: From a study of Papers published in 1990 in major journals in eight sciences (astrophysics, biology, chemistry, geophysics, mathematics, physics, psychiatry, and radiology) we learn the following. The median numbers of authors per paper range from 1.0 (in mathematics) to 3.7 (in the medical fields). Only a few percent (0-5%) of the papers have more than eight authors. Nearly half (30-55%) of the papers in American journals are partly or totally from abroad, except in the medicinal fields (10%). The fractions of papers with authors from two or more countries are as high as 26% (in astrophysics and geophysics). Mean paper lengths range from 4.6 1000-word pages in the medical fields to 8-13 pages in the observational sciences (astrophysics, biology, geophysics) and mathematics. The fraction of papers revised range from 8% in mathematics to 100% in geophysics. The mean publication times (submission to publication) range from 200 days in physics to 600 days in mathematics.

Keywords: Biology, Chemistry, Journals, Medical, Papers, Psychiatry, Publication, Radiology, Sciences

Notes: MModel

Lemoine, W. (1992), The frequency-distribution of research papers and patents according to sex - the case of Csir - India. *Scientometrics*, **24** (3), 449-469.

Full Text: [1992\Scientometrics24, 449.pdf](1992/Scientometrics24,%20449.pdf)

Abstract: The frequency distribution of research papers and patents produced by men and women scientists working at CSIR, India, is tested against the distribution function of the inverse power type (general or square). A K-S test and a t-test were applied to measure the conformity to the inverse power relationship. For both sexes the distribution of research papers took a bimodal shape and the entire data set did not follow an inverse power function. The male and female CSIR population of authors were divided into two groups, one comprising those researchers (50% of authors) who have written up to 10 articles, the other those scientists with 11 or more research papers. The first conform to a flat productivity distribution, whilst the second were well described by an inverse square power relationship. The distribution of patents did not show signs of the presence of two distinct sections of the distribution, however only the male-data fitted the inverse power relationship of the square type. It was also found that the proportion of less productive scientists was slightly greater for men than for women. Some preliminary ideas based on the characteristics of the data and on Indian cultural heritage, were discussed in order to explain some of the results here delineated.

Keywords: Cultural, Female, First, Function, India, Inverse Power, Inverse Power Function, Lotka Law, Male, Men, Nigeria, Papers, Patents, Population, Research, Science, Scientific Productivity, Women

? Hurt, C.D. and Budd, J.M. (1992), Modeling the literature of superstring theory - A case of fast literature. *Scientometrics*, **24** (3), 471-480.

Full Text: [1992\Scientometrics24, 471.pdf](1992/Scientometrics24,%20471.pdf)

Abstract: This paper used data generated in a previous study to model what can be termed fast literature. In this case, the literature of superstring theory was examined to determine if an anomalous case, such as superstring literature, might fit a theoretical distribution. Price’s Index was examined and found not to fit the data. The lognormal and the Weibull Distributions both appear to fit the observed distribution, however, the Weibull has better practical as well as theoretical strengths to model superstring literature. It is suggested that the literature of superstrings belongs in a separate class of literature, what we term fast literature. Additional study is indicated to determine if this type of literature is a significant factor in scientometrics.

Keywords: Information-Transfer, Literature, Model, Modeling, Scientometrics, Theory

? Egghe, L. and Ravichanra Rao, I.K. (1992), Classification of growth models based on growth rates and its applications. *Scientometrics*, **25** (1), 5-46.

Full Text: [1992\Scientometrics25, 5.pdf](1992/Scientometrics25,%205.pdf)

Abstract: In this paper, growth models are classified and characterised using two types of growth rates: from time t to t + 1 and from time t to 2t. They are interesting in themselves but can also be used for a quick prediction of the type of growth model that is valid in a particular case. These ideas are applied on 20 data sets collected by *Wolfram, Chu and* Lu. We determine (using the above classification as well as via nonlinear regression techniques) that the power model (with exponent > 1) is the best growth model for SCI-Tech online databases, but that Gompertz-S-shaped distribution is the best for social sciences and humanities online databases.

Keywords: Classification, Growth, Humanities, Model, Models, Prediction, Sciences, Social Sciences, T, Techniques

? Leemans, M.J., Maes, M., Rousseau, R. and Ruts, C. (1992), The negative binomial-distribution as a trend distribution for circulation data in flemish public-libraries. *Scientometrics*, **25** (1), 47-57.

Full Text: [1992\Scientometrics25, 47.pdf](1992/Scientometrics25,%2047.pdf)

Abstract: Based on data collected by the authors in Flemish public libraries, we show how the negative binomial distribution (NBD) can be used as a trend distribution for library circulation data. Although actual data show more variation than simple statistics can explain, we recommend the use of the NBD for practical, managerial purposes. As a consequence we also recommend the teaching of these methods in introductory library management courses.

Keywords: Management, Methods, Model, Statistics, Teaching

? Reyniers, P. (1992), Facts and figures on interlibrary lending in Dutch-speaking Belgium in 1989. *Scientometrics*, **25** (1), 59-76.

Full Text: [1992\Scientometrics25, 59.pdf](1992/Scientometrics25,%2059.pdf)

Abstract: A survey of interlending activities in Dutch-speaking Belgium was taken in order to coordinate future developments. Data on a broad range of topics were collected. The processing of numerical data is outlined. The figures must be put in perspective, due to the presence of estimates. The investigation remains however the first serious attempt to get an overall picture of interlending in Flemish libraries.

Keywords: Belgium, Estimates, First, Interlending, Investigation, Numerical Data, Survey

? Rousseau, R. (1992), Category theory and informetrics - Information production processes. *Scientometrics*, **25** (1), 77-87.

Full Text: [1992\Scientometrics25, 77.pdf](1992/Scientometrics25,%2077.pdf)

Abstract: Egghe’s continuous information production processes (in short IPP’s) are described using category theory. Therefore, we first review the main ingredients of this mathematical theory, introduced by Eilenberg and Mac Lane more than four decades ago. Then we show how the notion of duality, as used by Egghe, can be placed in the abstract framework of categorical duality. This leads to a natural isomorphism involving the identity functor on a category of continuous IPP’s. This natural isomorphism is completely similar to the well-known natural isomorphism between a finite-dimensional vector space and its double dual. We further show that to develop Egghe’s theory on IPP’s one needs no other intervals than the unit interval.

Keywords: First, Framework, Information, Intervals, Laws, Needs, Review, Theory

? Vanborm, J. (1992), From interlibrary lending statistics to clearinghouse - The use of ill statistics in Belgium. *Scientometrics*, **25** (1), 89-100.

Full Text: [1992\Scientometrics25, 89.pdf](1992/Scientometrics25,%2089.pdf)

Abstract: As in many other countries interlibrary lending (ILL) statistics were not systematically collected in Belgium until the seventies. Even today they give not always a complete coverage of the ILL situation in Belgium (an estimated 200.000 requests per year). However, electronic document ordering systems will change the present situation. They can be used to measure the performance of ILL, to improve its quality, to assess weaknesses in the ILL-system, to collect statistical data and to act as a clearinghouse for ILL billing.

Keywords: Belgium, Ill, Quality, Statistics

? Desmet, E. (1992), Information behavior in a scientific-technical environment - A survey with innovation engineers. *Scientometrics*, **25** (1), 101-113.

Full Text: [1992\Scientometrics25, 101.pdf](1992/Scientometrics25,%20101.pdf)

Abstract: A small written survey with innovation engineers in a large company is discussed, giving some figures on both behaviour and attitudes with respect to 1) information gathering, 2) information production/dissemination and 3) information storage and management. Most results confirm the trends in other research with R & D engineers: the use and management of information is rather improvised with low levels of sophistication. High tech information techniques (databases, online...) are only marginally important in this high-tech environment. Only younger engineers do some structured efforts. The general attitude is to rely mostly on oral, personal and occasional information sources. By combining positive attitudes and behaviour aspects towards information in the job, a measure of ‘information-orientation’ was constructed, which can be seen as an extension of the classical concept of ‘gate-keepers’ in a company. A few questions to reconstruct a ‘critical incident’ with respect to information problems reveal that information situations can be very time- and money-consuming but again solutions depend on occasional and unstructured information work. However the restricted written approach did not prove to be a good one for this kind of analysis. More in-depth interview-techniques will be necessary for analysis within the ‘critical incident theory’-frame.

Keywords: Analysis, Attitude, Attitudes, Behaviour, Environment, Gatekeepers, Information, Innovation, Management, Research, Small, Survey, Techniques, Trends, Work

Notes: MModel

? Dierick, J.C.J. (1992), Determining the Lotka parameters by sampling. *Scientometrics*, **25** (1), 115-148.

Full Text: [1992\Scientometrics25, 115.pdf](1992/Scientometrics25,%20115.pdf)

Abstract: In order to determine the Lotka parameters for a bibliography, one usually uses the complete data set. In this paper it is shown that it is possible to use only a fraction of the original data, namely by sampling randomly. However, sampling can be done either by source, i.e. selecting a fraction of the authors, or by item, i.e. selecting a fraction of the publications. It is shown here both by experiments, using computer simulations, and by mathematical approach, that only sampling by source is allowed for the mentioned purpose. Item samples give a completely disturbed idea about the Lotka’s law for the bibliography. From source sample size equal to 10% onwards, one gets good results. For the calculation of the Lotka exponent, a known, simple and fitting method is used and refined.

Keywords: Experiments, Law, Lotka, Publications, Sample Size, Size

Dorban, M. and Vandevenne, A.F. (1992), Bibliometric analysis of bibliographic behaviors in economic sciences. *Scientometrics*, **25** (1), 149-165.

Full Text: [1992\Scientometrics25, 149.pdf](1992/Scientometrics25,%20149.pdf)

Abstract: A bibliometric study based on the analysis of six Ph. D. thesis in economics. In this study the methodology is based on the distinction we made between two different information sources in each thesis: (1) the bibliography cited either at the end or at the beginning of the thesis, it represents the stock of useful or necessary publications, (2) the citations appearing in each dissertations as a whole, it determines the extent to which the stock is used, because it shows how many times a publication cited in the bibliography is cited in the thesis itself. The results concern the ratio ‘number of titles, authors’, the journal, monograph proportion, languages allocation, study of obsolescence. In the bibliography, 95% of books and articles are less than 30 years old. In the citations, articles and 95% of books are less than 20 years old

Keywords: Analysis, Bibliometric, Bibliometric Study, Citations, Economics, Information, Languages, Libraries, Methodology, Obsolescence, Publication, Publications

? Egghe, L. (1992), Generalized transfer principles in econometrics and informetrics. *Scientometrics*, **25** (1), 167-191.

Full Text: [1992\Scientometrics25, 167.pdf](1992/Scientometrics25,%20167.pdf)

Abstract: The generalized (also called extended) transfer principles as introduced in two earlier papers by Egghe and Rousseau are known to be stronger properties than the classical transfer principle of Dalton. Hence, functions satisfying one of these generalized principles are very good concentration measures. This paper studies the following non-trivial problem: how many different generalized transfer principles can a function satisfy? We show that a function can, at most, satisfy one generalized transfer principle. This also shows that a further generalization of transfer principles, comprising the generalized ones, is not possible. The proof of this result involves the solution of a norm problem in mathematical analysis and analytical geometry.

Keywords: Analysis, Function, Functions, Inequality, Papers, Principles, Solution

? Philips, R. (1992), Pseudometrics on bibliographic entities. *Scientometrics*, **25** (1), 193-199.

Full Text: [1992\Scientometrics25, 193.pdf](1992/Scientometrics25,%20193.pdf)

Abstract: The purpose of this paper is to define a pseudo-metric on bibliographic entities to measure the distance in content between them. An example of this pseudo-metric is given in the case that the content of the bibliographic material is characterised by means of UDC-numbers.

? Provost, F. and Nieuwenhuysen, P. (1992), Measuring overlap of data-bases in water-supply and sanitation using sampling and the binomial probability-distribution. *Scientometrics*, **25** (1), 201-209.

Full Text: [1992\Scientometrics25, 201.pdf](1992/Scientometrics25,%20201.pdf)

Abstract: A quick and easy method is presented to estimate the overlap of data bases, which can be used to assist the data base producers and managers in their policy towards coverage of their subject area. The method has been applied to bibliographic data bases on low-cost water supply and sanitation, yielding information for users and for the data base producers.

Keywords: Data Base, Information, Policy, Sanitation, Water

Notes: TTopic

Braun, T., Maczelka, H. and Schubert, A. (1992), Scientometric indicators datafiles: Summary statistics and trendlines of major geopolitical regions, 1980-1989. *Scientometrics*, **25** (2), 211-217.

Full Text: [1992\Scientometrics25, 211.pdf](1992/Scientometrics25,%20211.pdf)

Keywords: Facts, Figures, Life Sciences, Newest Version, Physics, Publication Output, Relative Citation Impact

? Glänzel, W. and Winterhager, M. (1992), International Collaboration of 3 East European Countries with Germany in the Sciences, 1980-1989. *Scientometrics*, **25** (2), 219-227.

Full Text: [1992\Scientometrics25, 219.pdf](1992/Scientometrics25,%20219.pdf)

Keywords: Germany

? Chu, H. (1992), Communication between Chinese and non-Chinese scientists in the discovery of high-TC superconductor. 1. The formal perspective. *Scientometrics*, **25** (2), 229-252.

Full Text: [1992\Scientometrics25, 229.pdf](1992/Scientometrics25,%20229.pdf)

Abstract: As the first part of a two-phase study, 240 documents highly cited in a self-created Chinese database and in Science Citation Index for the period of 1987-89 were examined to delineate the formal structure of communication in superconductivity research. Noteworthy similarities, e.g., analogous cited cores, identical publication sources, and comparable intellectual structures of cocitation data, were found in formal communication between Chinese and non-Chinese scientists. However, differences were also located in citedness, timeliness, and direction of communication.

Keywords: Chinese, Citation Patterns, Cocitation, Communication, Country, Database, First, High Metabolism Area, Physics, Publication, Research, Science, Science Citation Index, Structure

? Chu, H. (1992), Communication between Chinese and non-Chinese scientists in the discovery of high-TC superconductors. 2. The informal perspective. *Scientometrics*, **25** (2), 253-277.

Full Text: [1992\Scientometrics25, 253.pdf](1992/Scientometrics25,%20253.pdf)

Abstract: Data obtained through letter poll over 143 researchers who authored the 240 highly cited documents (See the first phase of the study) were used to describe the informal aspects of communication between Chinese and non-Chinese superconductivity researchers. While non-Chinese researchers played both roles equally, Chinese scientists were the destination more often than they were the source in informal communication. Chinese scientists were less visible than their counterparts in the informal domain. The mapping of the informal communication activities among the superconductivity researchers shows that all Chinese scientists except Zhao ZX, a special liaison between the two groups of researchers, clustered away from their non-Chinese colleagues.

Keywords: Chinese, Communication, First

? Huot, C., Quoniam, L. and Dou, H. (1992), A new method for analyzing downloaded data for strategic decision. *Scientometrics*, **25** (2), 279-294.

Full Text: [1992\Scientometrics25, 279.pdf](1992/Scientometrics25,%20279.pdf)

Abstract: Technology assessment survey is nowadays a specific and scientific subject that any manufacture needs for increasing productivity. This function was initially reserved to experts of the studied field. But the increase of information volume has called for a change. Now, we need specialists of technology assessment survey which know about sophisticated methods to extract strategic information from downloaded data. We will explain how to build strategic information. We present here a new and original method of data analysis. This Factorial Relational Analysis is born after 15 years of IBM France mathematics research center works on qualitative data analysis. The method is based on Relational Analysis. The particularity of this method is to work with sparse matrices and to obtain the best classification without any a priori fixation of number of classes. Relational Analysis is used in other sectors than the analysis of matrices issued from downloaded data. For example it is also used in computational lexicography or in credit scoring or in any domain where classification is concerned. Here we choose to present an example of an application in patent analysis.

Keywords: Analysis, Assessment, Classification, Data Analysis, France, Function, Information, Methods, Needs, Patent, Patent Analysis, Qualitative, Research, Survey, Technology, Technology Assessment, Work

? Leydesdorff, L. (1992), A validation-study of leximappe. *Scientometrics*, **25** (2), 295-312.

Full Text: [1992\Scientometrics25, 295.pdf](1992/Scientometrics25,%20295.pdf)

Abstract: Clusters of normalized title-words in two sets of patent data in the food-sector (from 1985 and 1989, respectively) are analyzed in terms of their underlying document and word structures. The clusters were generated by using the system LEXIMAPPE of the Paris School of Mines. Both input and output data were kindly made available for validation purposes. Analysis of the data shows that the “centrality” and the “density” of the clusters produced by LEXIMAPPE are primarily dependent on the number of word occurrences in the corresponding parts of the input matrix. While the clusters are kept approximately equal in terms of the number of words (with a maximum of 10), they vary widely in terms of the number of word occurrences in the underlying document sets. “Centrality” and “density” vary correspondingly. The contribution of the smallest cluster to the reduction of uncertainty in the prediction of the document structure is even smaller than that of 77 (other) single words. In the dynamic analysis, I found significant stability where LEXIMAPPE indicated major changes. However, like every clustering algorithm LEXIMAPPE is based on specific assumptions which may lead to specific results that cannot be simulated by using other methods. Researchers who base their results on LEXIMAPPE should be aware of the peculiarities specific to this system.

Keywords: Algorithm, Analysis, Assumptions, Changes, Clustering, Co-Word Analysis, Count, Lead, Leximappe, Methods, Model, Networks, One Might Wish, Patent, Prediction, Reduction, Science Indicators, Stability, Structure, Texts, Uncertainty, Validation

? Courtial, J.P. (1992), A validation-study of leximappe - Comment. *Scientometrics*, **25** (2), 313-316.

Full Text: [1992\Scientometrics25, 313.pdf](1992/Scientometrics25,%20313.pdf)

? Leydesdorff, L. (1992), A validation-study of leximappe - Reply. *Scientometrics*, **25** (2), 317-319.

Full Text: [1992\Scientometrics25, 317.pdf](1992/Scientometrics25,%20317.pdf)

? Okubo, Y., Miquel, J.F., Frigoletto, L. and Dore, J.C. (1992), Structure of international collaboration in science - Typology of countries through multivariate techniques using a link indicator. *Scientometrics*, **25** (2), 321-351.

Full Text: [1992\Scientometrics25, 321.pdf](1992/Scientometrics25,%20321.pdf)

Abstract: In this article patterns of international collaboration in science are investigated using a specific procedure to analyse data collected from the Science Citation Index. We develop an indicator based on the scientific linkages between countries established through internationally co-authored articles (COPs). The credibility, advantages and uses of this indicator are discussed. We apply the Correspondence Factorial Analysis method and the Minimum Spanning Tree classification to this indicator in order to observe the level of resemblance and the main characteristics of the collaboration structured by 98 countries in eight principal fields of science. The results shown summarize the diverse aspects of countries participating in collaborative works and bring into view the cognitive structure of international research. The use of these methods in the investigation of international collaboration contributes to the analysis of the complex structure of the scientific communities of different countries.

Keywords: Analysis, Classification, Collaboration, Credibility, Indicator, International, Investigation, Methods, Research, Science, Science Citation Index, Structure

Johnes, G. and Johnes, J. (1992), Apples and oranges: The aggregation problem in publications analysis. *Scientometrics*, **25** (2), 353-365.

Full Text: [1992\Scientometrics25, 353.pdf](1992/Scientometrics25,%20353.pdf)

Abstract: A major difficulty with bibliometric measures of departmental research contributions based upon publications counts has concerned the summing of publications of different types. An attempt is made in this paper to bypass this aggregation problem by appeal to the methods of Data Envelopment Analysis (DEA). In this way we investigate the technical efficiency of UK university departments of economics as producers of research. The data set used is an extended version of the one which informed the recent Universities Funding Council peer review, and the results obtained here are compared with those obtained by the Council. We conclude that, although due caution is needed in the interpretation of results, DEA has a positive contribution to make in the development of meaningful indicators of university performance.

Keywords: Aggregation, Assessments, Bibliometric, Data Envelopment Analysis, Development, Economics, Efficiency, Indicators, Methods, Peer Review, Peer-Review, Publications, Research, Review, UK, University, University Departments

Maczelka, H. and Zsindely, S. (1992), All well if starts well? Citation infancy of recently launched chemistry journals. *Scientometrics*, **25** (2), 367-372.

Full Text: [1992\Scientometrics25, 367.pdf](1992/Scientometrics25,%20367.pdf)

Abstract: The impact factor and the journal self-citation rate of 22 newly launched chemistry journals has been investigated. The dependence of these indicators on the journal’s age was found to be rather characteristic to the initial period of a journal’s ‘life cycle’.

Keywords: Chemistry, Impact Factor, Indicators, Journal, Journals, Self-Citation

? Glänzel, W. and Schubert, A. (1992), Some facts and figures on highly cited papers in the sciences, 1981-1985. *Scientometrics*, **25** (3), 373-380.

Full Text: [1992\Scientometrics25, 373.pdf](1992/Scientometrics25,%20373.pdf)

Keywords: Citation Impact, Publication Output, Relative Indicators

? Czapski, G., Frenkel, A., Kohn, D. and Shoham, A. (1992), Cooperation between Israeli and foreign researchers. *Scientometrics*, **25** (3), 381-400.

Full Text: [1992\Scientometrics25, 381.pdf](1992/Scientometrics25,%20381.pdf)

Abstract: This paper analyses the reasons, framework and trends of scientific cooperation between Israeli and foreign researchers for the period 1974-1983. The study used the ISI database purchased by the S. Neaman Institute, containing all Israeli publications for the above mentioned years. A complementary survey was carried out including a sample of two academic institutions. The survey database established on the basis of replies of 249 researchers who replied to the survey questionnaires includes data regarding 5,893 papers, 1550 of which had not been included in the ISI database. The findings show that about one third of the papers missing from the ISI database is due to the fact that authors did not note their permanent Israeli address under the paper’s title. Other reasons for the partial coverage of the ISI database is that the ISI database does not cover all the professional journals and all types of scientific publications. The survey points to an absolute increase of the actual bulk of the research performed by Israeli scientists abroad. Major differences were found between researchers among different departments as regards framework for research performed abroad, reasons and sources of funding. The main reason listed for foreign cooperation was that of true cooperation (50%) and this is a very positive phenomenon.

Keywords: Complementary, Cooperation, Database, Framework, Institutions, ISI, Journals, Papers, Publications, Questionnaires, Research, Scientific Publications, Survey, Trends

? Formann, A.K. (1992), Academic personnel-selection - Description and prognosis of the decisions made by the committee for the selection of candidates for a full professorship. *Scientometrics*, **25** (3), 401-414.

Full Text: [1992\Scientometrics25, 401.pdf](1992/Scientometrics25,%20401.pdf)

Abstract: On the example of filling the vacancy of a full professorship for general psychology, the usefulness of the least-squares variant of Guttman’s scalogram analysis (method of principal components for multicategory items) is demonstrated for giving assistance the process of personnel selection. Using some criteria being available per applicant such as adequacy of field of work, age, and number of publications, this scaling procedure results in weights for each of the categories of the criteria indicating the relative importance of each criterion, and scores for all applicants pointing at their aptness. Since the recommendations deduced from the applicants’ scores matched the decisions of the selection committee to a high degree, some aspects of the selection committee’s decision process could be reconstructed as well as the predictive power of the method of principal components is exemplified. From the observation that this method worked well in case of 46 applicants and up to 7 criteria altogether having 18 categories, but did fail if applied to 9 candidates only, its suitability for moderate sample sizes can be infered which can be seen to be typical of the first screening steps within a multi-stage selection process.

Keywords: Analysis, Contingency-Tables, Criteria, First, Personnel, Personnel Selection, Psychology, Publications, Recommendations, Scaling, Screening, Work

? Pouris, A. (1992), Economic sanctions and research-and-development. *Scientometrics*, **25** (3), 415-424.

Full Text: [1992\Scientometrics25, 415.pdf](1992/Scientometrics25,%20415.pdf)

Abstract: This article identifies the effects of disinvestment on the R & D activities in South Africa. The importance of the article lies in its relevance for science and trade policy and in the examination of this angle of sanctions against South Africa. The results indicate that foreign owned companies increase their R & D activities as the threat of disinvestment intensifies. The same phenomenon applies to the new management of companies which disinvest. A side finding of importance is the fact that only a small proportion (3%) of the R & D activity in the country is undertaken by foreign owned companies. A number of explanations am offered for the observed behaviours.

Keywords: Examination, Investment, Management, Policy, Relevance, Science, Small, South Africa, South-Africa

Notes: TTopic

Bordons, M. and Barrigón, S. (1992), Bibliometric analysis of publications of Spanish pharmacologists in the SCI (1984-89). 2. Contribution to subfields other than pharmacology and pharmacy (ISI). *Scientometrics*, **25** (3), 425-446.

Full Text: [1992\Scientometrics25, 425.pdf](1992/Scientometrics25,%20425.pdf)

Abstract: During the period 1984-89 Spanish pharmacologists published 344 papers (44.3% of their total scientific production) (Science Citation Index, CD-Edition) in journals classified by the SCI in subfields different from Pharmacology & Pharmacy. Distribution by institutions, geographical regions, journals, subfields and research levels am presented. The Normalized Journal Position (NJP) is introduced as indicator of the expected impact in each subfield. Results are compared with those of the analysis of the production of Spanish pharmacologists in the Pharmacology & Pharmacy subfield, presented in a previous paper. Some of the features detected am common to both areas, such as: increasing trend in the productivity over years irregular geographical distribution with three regions as major producers, or university as main producer institution. Special features of the extra-Pharmacology area are also pointed out: irregular growth of publication number over years, high dispersion of publications in journals and subfields high collaboration rate, and low percentage of authors with at least 1 paper/year, among others. Attending to journal of publication, cross-disciplinarity research of Spanish pharmacologists is analysed, being Neurosciences, Biochemistry & Molecular Biology and Physiology, the main border fields involved.

Keywords: Analysis, Basic Science, Collaboration, Growth, Indicator, Institutions, Journal, Journals, Papers, Publication, Publications, Research, SCI, Science Citation Index, Scientific Production, University

? Anderson, F. and Dalpe, R. (1992), A profile of Canadian coal and petroleum research communities. *Scientometrics*, **25** (3), 447-463.

Full Text: [1992\Scientometrics25, 447.pdf](1992/Scientometrics25,%20447.pdf)

Abstract: The objective of this paper is to show that various bibliometric indicators are a good departure point to describe a national research community, as well as the linkages between research institutions, the users of the research and the funders of the research community. We profile the Canadian coal and petroleum research communities. The role of CANMET, a government research laboratory, is examined as example of how our analysis can be useful to policy-makers and decision-makers.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Coal, Community, Indicators, Innovators, Institutions, Networks, Research

? Small, H. (1993), Macrolevel changes in the structure of cocitation clusters - 1983-1989. *Scientometrics*, **26** (1), 5-20.

Full Text: [1993\Scientometrics26, 5.pdf](1993/Scientometrics26,%205.pdf)

Abstract: At ISI we haw used a consistent method for clustering the combined Science Citation Index and Social Sciences Citation Index for the last seven years (1983 to 1989). This method involves clustering highly cited documents by single-link clustering and then clustering the resultant clusters, a total of four times. This gives a hierarchical or nested structure of clusters four levels deep. Relationships among clusters at a given level can be depicted by multidimensional scaling, and by comparing successive year maps we can see how the relationships of major disciplines have changed from year to year. We focus mainly on the two highest levels of aggregation, C4 and C5, to make observations about structural changes in science involving the major disciplines. Distinction is made between changes which appear to be cyclic or oscillatory in nature, and those which appear to be more permanent or unidirectional.

Keywords: Aggregation, Changes, Clustering, ISI, Multidimensional, Multidimensional Scaling, Nested, Permanent, Scaling, Science, Science Citation Index, Structure

Schubert, A. and Braun, T. (1993), Reference standards for citation based assessments so scientometrics. *Scientometrics*, **26** (1), 21-35.

Full Text: [1993\Scientometrics26, 21.pdf](1993/Scientometrics26,%2021.pdf)

Abstract: One of the most crucial points of citation-based assessments is to find proper reference standards to which the otherwise meaningless plain citation counts can be compared. Using such standards, mere absolute numbers can be turned into relative indicators, suitable for cross-national and cross-field comparisons. In the present study, three possible choice of reference standards for citation assessments are discussed. Citation rates of publications under study can be compared to the average citation rates of the papers of the publishing journals to result in Relative Citation Rate (RCR), an indicator successfully used in several comparative scientometric analyses (see, e.g. Refs 1-5). A more ‘customized’ reference set is defined by the related records in the new CD Edition of the Science Citation Index database. Using the so-called ‘bibliographic coupling’ technique, a set of papers with a high measure of similarity in their list of references is assigned to every single paper of the database. Beside of being an excellent retrieval tool, related records provide a suitable reference set to assess the relative standing of a given set of papers as measured by citation indicators. The third choice introduced in this study is specifically designed for assessing journals. For this purpose, the sa of journals cited by the journal in question seems to be a useful basis to compare with. The pros and cons of the three choices are discussed and several examples are given.

Keywords: CD, Citation, Citation Counts, Countries, Database, Facts, Figures, Impact, Indicator, Indicators, Journal, Journals, Life Sciences, Newest Version, Papers, Physics, Publication Output, Publications, Publishing, Records, Science Citation Index, Scientometric, Similarity, Standards

? Bonitz, M., Bruckner, E. and Scharnhorst, A. (1993), The Science Strategy Index. *Scientometrics*, **26** (1), 37-50.

Full Text: [1993\Scientometrics26, 37.pdf](1993/Scientometrics26,%2037.pdf)

Abstract: A new indicator, Science Strategy Index, is proposed, which is based on the scattering of a country’s science activity over all science fields and related to the world distribution of the science fields. The indicator allows to compare the structure of the publication output of countries as reflected by the used database, irrespective of the size of the countries. If the science structure of each country is related for comparison to that one of each other country, the indicator converts into a structural measure which enables to cluster countries according to their structural similarity. The cluster map of countries achieved in this way deserved intense discussion upon the different science strategies of countries and their geographic, political, communicative, and socio-cultural background.

Keywords: Comparison, Countries, Database, Indicator, Publication, Scattering, Science, Similarity, Size, Structure

? Czerwon, H.J. and Havemann, F. (1993), Influence of publication languages on the citation rate of scientific articles - A case-study of East German journals. *Scientometrics*, **26** (1), 51-63.

Full Text: [1993\Scientometrics26, 51.pdf](1993/Scientometrics26,%2051.pdf)

Abstract: In order to quantify the influence of publication languages on the rate of citation of scientific articles, such East German journals from the Science Citation Index database were selected which publish relevant shares of contributions in several languages, especially in English and German. For a fixed period of time (1988) the selective citation impact of both English- and German-language articles was calculated. The results of our investigation reveal a non-uniform picture: In some cases English-language papers exhibit a significantly higher citations-per-paper average than German-language articles, but in a few cases German-language publications achieve a higher mean citation rate. For the half of selected journals there does not exist a statistically significant difference of citation frequencies of publications in both languages. Possible causes of these phenomena (editorial practice of journals, native countries of authors) are considered.

Keywords: Citation, Database, Investigation, Journals, Languages, Papers, Practice, Publication, Publications, Science Citation Index

? De Bruin, R. and Moed, J. (1993), Delimitation of scientific subfields using cognitive words from corporate addresses in scientific publications. *Scientometrics*, **26** (1), 65-80.

Full Text: [1993\Scientometrics26, 65.pdf](1993/Scientometrics26,%2065.pdf)

Abstract: An appropriate delimitation of scientific subfields constitutes one of the key problems in bibliometrics. Several methods have been explored for this task. The main ones are co-citation analysis, co-word analysis, the use of indexing systems based on controlled or uncontrolled keywords, and finally the use of a classification of scientific journals into subfields or categories. In our contribution we will explore a new method, which is based on cognitive words from addresses (corporate sources) in scientific publications. Cognitive address words are words referring to scientific (sub)fields, methods or objects of research, that appear in the institutional affiliations of the publishing authors (e.g., ‘Department of Pharmacology,’ AIDS Research Center’). We will focus on the *Science Citation Index (SCI),* published by the Institute for Scientific Information. Our methods will be applied to a multidisciplinary set of articles extracted from the journals *Science and Nature.*

Keywords: AID, AIDS, Analysis, Bibliometrics, Classification, Co-Citation, Co-Citation Analysis, Cocitation, Institute For Scientific Information, Journals, Methods, Multidisciplinary, Publications, Publishing, Research, SCI, Science Citation Index, Scientific Journals, Scientific Publications

? Glänzel, W. and Schubert, A. (1993), A characterization of scientometric distributions based on harmonic means. *Scientometrics*, **26** (1), 81-96.

Full Text: [1993\Scientometrics26, 81.pdf](1993/Scientometrics26,%2081.pdf)

Abstract: The traditional stochastic approach to scientometric and bibliometric phenomena is based on measuring the absolute number of objects (e.g., publications, topics, citations). These measures reflect underlying rules such as the cumulative advantage principle and lead to classical statistical functions such as arithmetic mean and standard deviation. An alternative measure based on the contribution share of an individual object in the entirety of related objects reveals more about the coherence in the analyzed structure. This approach is connected with (conditional) harmonic means. The analysis of the properties of these statistical functions leads to a special urn-model distribution which has an analogous behaviour to that of the Waring distribution in connection with conditional arithmetic means. The new distribution combines specific properties (long tail, flexibility of the distribution shape) of the two scientometric favourites, the Waring and the negative binomial distribution. Five methods of parameter estimation are presented. The fit and the properties of this special urn-model distribution are illustrated by three scientometric examples, particularly, by two citation rate distributions with different shapes and one publication activity distribution with lacking zero frequencies.

Keywords: Alternative, Analysis, Behaviour, Bibliometric, Citation, Citations, Flexibility, Functions, Lead, Methods, Publication, Publication Activity, Publications, Scientometric, Standard, Structure

? Kretschmer, H. (1993), Measurement of social stratification: A contribution to the dispute on the Ortega hypothesis. *Scientometrics*, **26** (1), 97-113.

Full Text: [1993\Scientometrics26, 97.pdf](1993/Scientometrics26,%2097.pdf)

Abstract: Some discussion papers about the ORTEGA hypothesis were published in *Scientometrics.* One aspect of these discussions was the necessity for the future extension of empirical research to gain a better foundation for the acceptance or refutation of the Ortega hypothesis which states that the research done by average scientists substantially contributes to the advance of science. In this direction an empirical study about the stratification in coauthorship networks is represented in this paper. It was tested whether the extent of stratification decreases with the increasing number of coauthors per paper.

Keywords: Acceptance, Citation, Coauthorship, Papers, Research, Science, Scientists, Scientometrics

? Van Leeuwen, T. and Tijssen, T. (1993), Assessing multidisciplinary areas of science and technology: A synthetic bibliometric study of Dutch nuclear energy research. *Scientometrics*, **26** (1), 115-133.

Full Text: [1993\Scientometrics26, 115.pdf](1993/Scientometrics26,%20115.pdf)

Abstract: This paper presents a selection of results of a comprehensive quantitative, research literature-based study of Dutch energy research. The primary goal of this paper is to provide an overview of what bibliometfic data from ISI and non-lSI databases may offer to describe the state of affairs in a scientific field. It illustrates the added value of combining bibliometric indicators of publication output, international visibility, international co-operation, and interdisciplinarity in a study of nuclear energy research in the 1980’s when its budget decreased dramatically.

Keywords: Bibliometric, Bibliometric Indicators, Budget, Cooperation, Indicators, Interdisciplinarity, International, International Co-Operation, International Cooperation, ISI, Primary, Publication, Research

Leydesdorff, L. and Cozzens, S.E. (1993), The delineation of specialities in terms of journals using the dynamic journal set of the SCI. *Scientometrics*, **26** (1), 135-156.

Full Text: [1993\Scientometrics26, 135.pdf](1993/Scientometrics26,%20135.pdf)

Abstract: In order to attribute journals to specialties in a dynamic journal set by using aggregated journal-journal citations derived from the Science Citation Index, it is necessary to complement the multi-variate analysis of this data with a time- series perspective. This calls for a more analytical approach to the problem of choice among the many possible parameters for clustering. Changes in the disciplinary structure of science are tracked by using the differences among the multi-variate analyses for the various years. It is impossible to attribute change systematically to structure, noise, or deviance if these uncertainties are not clearly defined ex ante. The study discusses the various choices which have to be made, in both conceptual and methodological terms In addition to hierarchies among journals, one has to assume heterarchy among journal groups (and their centroids). For comprehensive mapping, a concept of ‘macro-journals’ as representations of a density of points in the multi-dimensional space is defined. Empirical results indicate the feasibility of dynamic journal-journal mapping by using these methods

Keywords: Analysis, Bibliometric Assessment, British Science, Citations, Clustering, Decline, Disciplinary Structure, Journal, Journals, Matrices, Methods, Science, Science Citation Index, Structure, UK Scientific Performance

Mendez, A., Gomez, I. and Bordons, M. (1993), Some indicators for assessing research performance without citations. *Scientometrics*, **26** (1), 157-167.

Full Text: [1993\Scientometrics26, 157.pdf](1993/Scientometrics26,%20157.pdf)

Abstract: The study aims at designing a set of indicators which, integrated altogether, should be able to inform on the kind of research published in journal articles and its proximity to their specific forefronts. The set of indicators is composed of two subsets, one including information of the authors, ‘research performers indicators’, and other embodying information of the references used, ‘source indicators’. The source indicators are compared with the references pattern of specific paradigmatic journals used as standard framework of the research field. Three case studies dealing with the Spanish research on Immunology, Neurosciences and Pharmacognosy will be presented. The application of the indicators gave the following results: Spanish Immunology published in foreign journals was basic in its scope while the one published in domestic journals dealt with applied and clinical Medicine. Neuroscience published in foreign journals by financed Hospitals appertained to the forefront and presented a broad scope, Neuroscience published in foreign journals by non-financed Hospitals was applied research and Neuroscience published by Universities, also in foreign journals, represented basic research done in a closed system. The case of Spanish Pharmacognosy is more difficult to interpret as three subject fields are involved (Pharmacology, Chemistry and Botany). The indicators did not clearly differentiate between the research published in domestic and foreign journals, although it seems that Spanish scientists are more interested in the pharmacological and botanical aspect of the natural products than in their chemical structure.

Keywords: Case Studies, Clinical, Framework, Indicators, Information, Journal, Journal Articles, Journals, Research, Standard, Structure

? Van Raan, A. and Tussen, R. (1993), The neural net of neural network research: An exercise in bibliometric mapping. *Scientometrics*, **26** (1), 169-192.

Full Text: [1993\Scientometrics26, 169.pdf](1993/Scientometrics26,%20169.pdf)

Abstract: In this paper we discuss the limits and potentials of bibliometric mapping based on a specific co-word analysis. The subject area is neural network research. Our approach is a ‘simulation’ of expert assessment by offering the reader a narrative of the field which can be used as background information when ‘reading’ the bibliometric maps. The central issue in the applicability of bibliometric maps is whether these maps may supply ‘additional intelligence’ to users. In other words, whether such a bibliometric tool has an epistemological value, in the sense that it ecriches existing knowledge by supplying ‘unexpected’ relations between specific ‘pieces’ of knowledge (‘synthetic value’) or by supplying ‘unexpected’ problems (‘creative value’). We argue that sophisticated bibliometric mapping techniques are indeed valuable for further exploration of these ‘epistemological’ potentials. In particular, these techniques may open new avenues to study science as a self-organizing system in the form of a ‘neural network like’ structure of which the bibliometric map is a first-order approximation. In that sense, this paper deals with the ‘neural net of neural network research’ as our bibliometric techniques in fact mimic a connectionistic approach.

Keywords: Analysis, Assessment, Bibliometric, Bibliometric Mapping, Bibliometric Techniques, Citation, Combined Cocitation, Information, Knowledge, Network, Neural Network, Reading, Relations, Research, Science, Simulation, Structure, Techniques, Word Analysis

? Schmoch, U. (1993), Tracing the knowledge transfer from science to technology as reflected in patent indicators. *Scientometrics*, **26** (1), 193-211.

Full Text: [1993\Scientometrics26, 193.pdf](1993/Scientometrics26,%20193.pdf)

Abstract: The use of references of patent search reports as transfer indications needs a good theoretical understanding of the underlying examination procedures. On this background, different patent indicators based on sample patents and on respective references can be established and combined to a network which gives an interesting insight into the complex process of knowledge transfer from science to technology.

Keywords: Examination, Indications, Indicators, Knowledge, Needs, Network, Patent, Patents, Procedures, Science, Technology, Understanding

? Vinkler, P. (1993), Research contribution, authorship and team cooperativeness. *Scientometrics*, **26** (1), 213-230.

Full Text: [1993\Scientometrics26, 213.pdf](1993/Scientometrics26,%20213.pdf)

Abstract: Activity shares in different types of research work for coauthors of scientific papers were detected by questionnaire methods. It was found e.g. that first authors perform about 70% of the total work needed for two authored papers, which decreases to 34% for papers with five authors. From Total Activity Shares determined for coauthors Total Team Contribution Factors could be calculated for cooperating teams. Total as well as Intramural and Extramural Team Cooperativeness for research teams were obtained by relating shares of impact factor scores for the investigated teams to the total.

Keywords: First, Impact Factor, Impact Factor Scores, Indicators, Methods, Papers, Questionnaire, Research, Research Collaboration, Research Work, Scientists, Work

? Courtial, J.P., Callon, M. and Sigogneau, A. (1993), The use of patent titles for identifying the topics of invention and forecasting trends. *Scientometrics*, **26** (2), 231-242.

Full Text: [1993\Scientometrics26, 231.pdf](1993/Scientometrics26,%20231.pdf)

Abstract: Co-word analysis applied to patents through WPIL normalized title words appears to give a useful picture of a given field: we obtain both qualitative (themes) and quantitative information (weight of themes). It also gives information about the strategic aspects of the themes. Furthermore, in some cases, it is an indication of the future of certain themes that may help forecasting and management studies. Finally, it provides information about what could be a real technology growth process, in relation to the so-called translation model used in co-word analysis.

Keywords: Analysis, Co-Word Analysis, Forecasting, Growth, Information, Management, Model, Network, Patents, Polymer Chemistry, Qualitative, Technological Research, Technology, Tool, Translation

? Bonheim, H. (1993), The reception of Polish philology abroad. *Scientometrics*, **26** (2), 243-253.

Full Text: [1993\Scientometrics26, 243.pdf](1993/Scientometrics26,%20243.pdf)

Abstract: A bibliometric survey of 28 scholars named in Poland as being the leading scholars in the fields of Linguistics and of English and American Studies shows that only five of them had done work which was cited more than once a year during the eleven years 1980 to 1990. The reasons are apparently not only the poverty of the libraries currently available in Poland but also the restricted selection of Polish journals represented in the citation indices. Suggestions are made as to how good scholarly work done in Poland could be made better known in the rest of the world.

Keywords: Bibliometric, Bibliometric Survey, Citation, Journals, Poverty, Survey, Work

? Hussain, S.S.M. and Nunez, D.A. (1993), British otorhinolaryngological research - An analysis of publication trends. *Scientometrics*, **26** (2), 255-262.

Full Text: [1993\Scientometrics26, 255.pdf](1993/Scientometrics26,%20255.pdf)

Abstract: 1081 otorhinolaryngological articles originating from departments in the British Isles, published in 8 leading English language speciality journals from 1985-1989 were analysed to determine author and content trends. Articles were classified as clinical investigative, laboratory based, case report or review/editorial. The institution of origin, total number of authors and identity of the first three were recorded. There is evidence of an increase in published British otolaryngological research and in the extent of researcher collaboration.

Keywords: Clinical, Collaboration, Evidence, First, Journals, Medical Journals, Origin, Research, Trends

? Liming, L. and Lihua, L. (1993), Scientific publication activities of 32 countries - Zipf-Pareto distribution. *Scientometrics*, **26** (2), 263-273.

Full Text: [1993\Scientometrics26, 263.pdf](1993/Scientometrics26,%20263.pdf)

Abstract: The paper examines the qualitative as well as quantitative indicators for the assessment of the scientific publication activities of 32 countries, with special attention to the Zipf-Pareto distribution of those indicators. Also discussed is the linear relationship between the number of first authors of scientific papers in a given country and the number of papers it produced. Based on these discussions, a comprehensive indicator combining the merits of quantitative and qualitative indicators is suggested. The ranking of the 32 countries by this indicator is found to follow also Zipf-Pareto distribution.

Keywords: Assessment, First, Indicator, Indicators, Papers, Publication, Qualitative, Ranking

? Whitney, G. (1993), Patterns of authorship in major bibliographic databases - The European region. *Scientometrics*, **26** (2), 275-292.

Full Text: [1993\Scientometrics26, 275.pdf](1993/Scientometrics26,%20275.pdf)

Abstract: European authorship trends in fifteen major scientific and technical bibliographic databases on the DIALOG information system are examined for works published between 1970 and 1990. There was an increasing number of records with European authors in 21% of the data set. In 6%, an overall decline was found. In 52%, authorship increased into the 1980’s, and then declined. The mort heavily represented countries were the former Soviet Union, the United Kingdom, Germany, and France. Overall, with the exception of MEDLINE, BIOSIS, and INSPEC, coverage of the works of European authors has been declining over the past twenty years and particularly so in the last five.

Keywords: Authorship, France, Germany, Information, MEDLINE, Records, Trends, United Kingdom

? Caraca, J.M.G., Dasilva, C.M. and Massimo, L. (1993), Research-and-development indicators and socioeconomic cohesion. *Scientometrics*, **26** (2), 293-309.

Full Text: [1993\Scientometrics26, 293.pdf](1993/Scientometrics26,%20293.pdf)

Abstract: An indicator was developed to analyze the distribution of EC support to research projects in the less favoured peripheral regions of Europe, compared to support in the economically stronger com regions. For this purpose it was assumed that in theory EC research funds and contracts would tend, on average, to be allocated according to the scientific potential of each country or region. An R & D activity is considered to contribute to socio-economic cohesion if the share obtained by the less favoured regions is larger than their share of the total European scientific potential. This assessment was made both for the total of all R & D activities and for each specific research programme. It emerges that the requirement for high scientific standards is not an obstacle to the participation of less favoured regions in Community research.

Keywords: Assessment, EC, Europe, Indicator, Potential, Requirement, Research, Standards, Theory

? Hemlin, S. (1993), Scientific quality in the eyes of the scientist - A questionnaire study. *Scientometrics*, **27** (1), 3-18.

Full Text: [1993\Scientometrics27, 3.pdf](1993/Scientometrics27,%203.pdf)

Abstract: In a questionnaire study Swedish university scientists in different research areas were asked about their conceptions of scientific quality. The items concerned relationships between quality and the research effort, the researcher, the research environment, research effects, research policy and organization, research financing and research evaluation. 224 persons (56% of the sample) answered. Results showed that researchers shared views on scientific quality, but there were also a number of differences between soft and hard sciences. It is concluded that the differences largely support the distinction between “human” and natural sciences, as well as the one between pre-paradigmatic and paradigmatic sciences. Implications for the evaluation of research are discussed.

Keywords: Environment, Evaluation, Financing, Policy, Quality, Questionnaire, Research, Research Evaluation, Research Policy, Sciences, University

? Qurashi, M.M. (1993), Dependence of publication-rate on size of some university groups and departments in UK and Greece in comparison with NCI, USA. *Scientometrics*, **27** (1), 19-38.

Full Text: [1993\Scientometrics27, 19.pdf](1993/Scientometrics27,%2019.pdf)

Abstract: In a series of studies aimed at investigating the dependence of per-capita research output (R), of an interacting group of research workers, on the size of the group, the author had shown that the per-capita research output of various research groups and institutes in U. S. A., U. K., Pakistan and Bangladesh shows an initial approximately linear rise, followed by one or more mixima, the first one being at group size of 6 to 8 persons. In the present communication, we present a fine analysis of the reported data for (a) physics departments of U. K. universities (in 1985-86) and (b) mathematics departments of two universities in Greece (from 1975 to 1984), using close sampling-intervals of DELTAN = 2 and 3 for group-sizes. The results of this reanalysis show that the data for U. K. physics departments exhibits a series of peaks of per-capita research output (R) at N = 11, 19, 25, 36, 46, etc., which compare well with the corresponding maxima already found in the 1977 per-capita output of National Cancer Institute, U. S. A., at N = 7, 15, 26, 34 and 44. Comparison of these two yields the following mean positions for the five peaks viz N = 9±2, 17±2, 26±0, 35±1 and 45±1. These appear to be close to multiples of 8.5, indicating the possibility that a sub-group of 8 to 9 persons could be forming a basic unit of interaction in these particular research groups. The data from the mathematics departments of two Greek universities, which falls in the range of N = 20 to N = 44, also shows two maxima, of per-capita output at N = 27 and 34.5 (and possibly one at about 18), which fit in well with the pattern described above. It appears likely that the above concept could open up new avenues in management practices. Accordingly, further studies are in hand on the relevant characteristics of the output of various institutes and, if possible, a fuller study of size and nature of the sub-groups noted above.

Keywords: Analysis, Bangladesh, Communication, First, Greece, Interaction, Laboratory Size, Management, Pakistan, Research, Size, Universities

? Nederhof, A.J. and Moed, H.F. (1993), Modeling multinational publication - Development of an online fractionation approach to measure national scientific output. *Scientometrics*, **27** (1), 39-52.

Full Text: [1993\Scientometrics27, 39.pdf](1993/Scientometrics27,%2039.pdf)

Abstract: This study of multinational publication (publications involving authors from more than one country) focuses on a viable method of fractionation, which can be used in on-line bibliometric research. Fractionation occurs when the credit for co-authored papers is added only partially to the total of publications of countries or authors. We attempted to find an empirical relation between the share of a country’s papers in some field that is multinationally co-authored and the degree of fractionation which results. A linear regression analysis yielded a significant correlation of -0.95. The fractionation method is the first that can be applied to publication data collected on-line. A comparison is made with fractionation by first author (i.e., first address) counting. Application of the method to British scientific output for 1984-1989 suggests that British output was stable. The fractionation method can be applied to both natural and life sciences and to social and behavioral sciences. Findings suggest that similar processes of multinational publication are prevalent in both types of science. Implications of the model are discussed.

Keywords: Analysis, Bibliometric, Bibliometric Assessment, Bibliometric Research, Collaboration, Comparison, Cooperation, First, Life, Life Sciences, Model, Modeling, Papers, Performance, Publication, Publications, Regression Analysis, Research, Science, Sciences, Scientific Output

? Milman, B.L. and Gavrilova, Y.A. (1993), Analysis of citation and co-citation in chemical engineering. *Scientometrics*, **27** (1), 53-74.

Full Text: [1993\Scientometrics27, 53.pdf](1993/Scientometrics27,%2053.pdf)

Abstract: This paper presents the results of the citation study in 24 leading journals on chemical engineering for 1987. The selective methodology or the analysis of co-citation limited only to this discipline is based on relatively low thresholds of citation and co-citation. The established research fronts refer mostly to basic research. The flow of information and knowledge to chemical engineering is determined to the extent of 70-90% by the works in this very field, as is indicated by the analysis of citations. The geography of research fronts was determined. The USSR has a very low fraction of frontal papers. This can be explained by the publication of papers in Russian and by a large number of secondary and applied research. This type of research is revealed by frequent citation of books and a small fraction of highly cited papers.

Keywords: Analysis, Citation, Citations, Clusters, Co-Citation, Cocitation, Collagen Research, Combined Cocitation, Information, Journals, Knowledge, Methodology, Papers, Policy, Publication, Research, Research Fronts, Science, Scientific Literatures, Small, Specialties, Subfields, Thresholds, Word Analysis

Notes: MModel

Coleman, S.R. (1993), Bradford distributions of social-science bibliographies varying in definitional homogeneity. *Scientometrics*, **27** (1), 75-91.

Full Text: [1993\Scientometrics27, 75.pdf](1993/Scientometrics27,%2075.pdf)

Abstract: Six social-science bibliographies were ranked along a complex ordinal dimension of the ‘homogeneity’ of (1) the defining criteria for including items in a bibliography or (2) the disciplinary source(s) of the literature. The most homogeneous bibliography exhibited the classic linearity of the graphic form of Bradford’s Law, but the most heterogeneous bibliographies exhibited concavity in their graphic display. The lower the overall article/journal density in a bibliography, the greater the curvature (concavity) of its Bradford plot. Results were discussed in relation to the generalizability of Bradford’s Law and to differences between scholarly practices in the social and natural sciences.

Keywords: Bibliographies, Criteria, History, Literature, Lotka Law, Psychology, Sciences, Zipf

? Harsanyi, M.A. and Harter, S.P. (1993), Ecclesiastes effects. *Scientometrics*, **27** (1), 93-96.

Full Text: [1993\Scientometrics27, 93.pdf](1993/Scientometrics27,%2093.pdf)

Abstract: The reward system in science involves several psychosocial processes that can be named after books in the Bible: Merton proposed the “Matthew Effect” and Turner and Chubin offered the “Ecclesiastes Hypothesis,” based on relevant biblical passages. This article identifies several other bibliometric phenomena described in Ecclesiastes, including an explanation of why there is a multiplication of specializations in disciplines with growing literatures.

Keywords: bibliometric/explanation/science

? Vinkler, P. (1993), Percentage patent representation (PPR) bilateral patent balance (BPB) and patent dominancy (PD) indicators characterizing international patenting relations. *Scientometrics*, **27** (1), 97-103.

Full Text: [1993\Scientometrics27, 97.pdf](1993/Scientometrics27,%2097.pdf)

Abstract: In order to characterize the integration of countries into the world intellectual property network some indicators are offered. Percentage Patent Representation (PPR) gives the percentage share of patents granted to the inventors of a given country in the total number of patents granted to all foreign patentees. The ratio of PPR indices for two countries yields the Bilateral Patent Balance (BPB) indicator, which is characteristic of a mutual patent representation. Patent Dominancy (PD) index is the number of BPB indices higher than unity for a set of countries. PD indices can be related to GDP and growth of export values.

Keywords: Growth, Indicator, Indicators, Integration, Intellectual Property, Network, Patent, Patents, Representation, United-States

Saavedra, F., Mackenzie, M.R., Pessot, R. and Krauskopf, M. (1993), Size and aging of the scientific community in Chile. *Scientometrics*, **27** (2), 105-117.

Full Text: [1993\Scientometrics27, 105.pdf](1993/Scientometrics27,%20105.pdf)

Abstract: The size and ageing of the Chilean scientific community was studied using as data the individuals actively engaged in research projects funded by the National Fund for Scientific and Technological Development (FONDECYT). Between 1982 and 1991, 4966 individuals participated at least once, either as responsible for the research or as qualified associate in one term of the funding period. From this population, 2765 persons can be considered further committed with scientific research. As for sex, about 30% of the researchers are women. Taking into account all the disciplines, and in addition to the fact that the size of the Chilean scientific community seems to be subcritical, the study reveals that the workforce has been ageing dangerously through the years. The number of young scientists becoming part of the scientific work-force is decreasing. Research in mathematics, physics and chemistry, although qualitatively competitive, relies only on an extremely small group of excellent scientists, situation which is seriously affecting the scientific capacity that the country needs. Biology, although with a higher number of individuals, exhibits a pattern of ageing which will also affects the possibilities to strengthen the scientific demands. The global context in which science develops, leads to a brain drain that Third World countries will have to overcome, implementing public policies to offer the support that young people require to nurture the scientific strength. Indigenous Ph. D. programs demand urgent attention of policy decision makers as well as from research universities which need to offer opportunities to substitute, when existing, their incompetent faculty.

Keywords: Ageing, Brain, Capacity, Chemistry, Chile, Community, Demand, Facts, Faculty, Figures, Needs, Newest Version, Policy, Policy Decision, Population, Productivity, Publication Output, Relative Citation Impact, Research, Science, Scientific Research, Scientometric Indicators, Sex, Size, Small, United-States, Universities, Women

? Cambrosio, A., Limoges, C., Courtial, J. and Laville, F. (1993), Historical scientometrics? Mapping over 70 years of biological safety research with co-word analysis. *Scientometrics*, **27** (2), 119-143.

Full Text: [1993\Scientometrics27, 119.pdf](1993/Scientometrics27,%20119.pdf)

Abstract: This paper relates the results of a co-word analysis of over 70 years of biological safety literature. The database used in this project is the Songer Safety Bibliography (SSB) which lists around 17,000 references. The results show biological safety to be a very fragmented field, characterized by the existence of several relatively independent foci of interest, none of which has been able to structure the field into a tight network. Early periods of activity were marked by the construction of the basic tools of biological safety practices. Those tools became a ‘robust package’ which, in more recent periods, was used routinely. While the safety problems related to recombinant DNA research have received much attention in the general press, they do not seem to occupy a prominent place within the biological safety literature, at least the one compiled in SSB.

Keywords: Analysis, Database, DNA, Literature, Network, Research, Safety, Scientometrics, Structure

Garg, K.C., Sharma, P. and Sharma, L. (1993), Bradford’s law in relation to the evolution of a field: A case study of solar power research. *Scientometrics*, **27** (2), 145-156.

Full Text: [1993\Scientometrics27, 145.pdf](1993/Scientometrics27,%20145.pdf)

Abstract: Based on the data of growth of literature in the field of solar power, the present paper investigates the stage of evolution at which the scattering of articles over journals is similar to Bradford’s curve, i.e. the stage at which Bradford’s law is valid. Traces the related changes that take place in the size and elements of the core during the evolution and growth of literature. The study reveals that a curve similar to Bradford’s curve is obtained when the field matures. The finding has been supported with the help of a simple mathematical model.

Keywords: Changes, Evolution, Growth, Journals, Law, Literature, Mathematical Model, Model, Scattering, Size

Nots: UUniversity

Nederhof, A.J., Meijer, R.F., Moed, H.F. and Vanraan, A.F.J. (1993), Research performance indicators for university departments: A study of an agricultural university. *Scientometrics*, **27** (2), 157-178.

Full Text: [1993\Scientometrics27, 157.pdf](1993/Scientometrics27,%20157.pdf)

Abstract: The present bibliometric study extends previous work by focusing on the research performance of departments in the natural and life sciences, the social and behavioral sciences, and the humanities. The present study covers all 70 departments from one agricultural university, and several veterinary departments of a second university. The impact analysis was extended by including other types of documents than journal articles. For about a third of the departments, publications not covered in citation indexes accounted for at least 30% of the citations to their total oeuvre. To deal with different citation and publication habits in the various fields, both short-term and medium-term impact assessments were made. The commonly used three year window is not universally applicable, as our results show. The inclusion of self-citations forms an important source of error in the ratio of actual, expected impact. To cope with this, the trend and level of self- citations was compared at university level with that in a matched sample of publications. Moreover, at a departmental level, self-citation rates were used to detect departments with divergent levels of self-citation. The expected impact of journals accounted for only 18% of the variance in actual impact. Comparison of bibliometric indicators with two peer evaluations showed that the bibliometric impact analyses provided important additional information

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Bibliometric Study, Citation, Citation Indexes, Citations, Economics, Error, Humanities, Impact Analysis, Indicators, Information, Journal, Journal Articles, Journals, Life, Life Sciences, Publication, Publications, Research, Research Performance, Sciences, Self-Citation, University, Veterinary, Work

? Pichappan, P. (1993), Identification of mainstream journals of science speciality - A method using the discipline-contribution score. *Scientometrics*, **27** (2), 179-193.

Full Text: [1993\Scientometrics27, 179.pdf](1993/Scientometrics27,%20179.pdf)

Abstract: He and Pao’s method of identifying specific discipline journals is improved by adding the citing impact factor and self-citing rate. The proposed indicator strikes a balance by discounting the size of a discipline. And also this indicator paves the way to identify the constituent journals of a discipline. This method was tested in Physics, Applied Physics and Astronomy and Astrophysics. The findings lead to the rethinking about the inclusion of many journals in these fields.

Keywords: Bibliometric Indicators, Citation Measures, Impact, Impact Factor, Indicator, Journals, Lead, Model, Physics, Reliability, Scientific Journals, Selection, Size, Subfields

? Egghe, L. (1993), On the influence of growth on obsolescence. *Scientometrics*, **27** (2), 195-214.

Full Text: [1993\Scientometrics27, 195.pdf](1993/Scientometrics27,%20195.pdf)

Abstract: In many papers, the influence of growth on obsolescence is studied but a formal model for such an influence has not been constructed. In this paper, we develop such a model and find different results for the synchronous and for the diachronous study. We prove that, in the synchronous case, an increase of growth implies an increase of the obsolescence, while, in the diachronous case, exactly the opposite mechanism is found. Exact proofs are given, based on the exponential models for growth as well as obsolescence. We leave open a more general theory.

Keywords: Growth, Mechanism, Model, Models, Obsolescence, Papers, Theory

Nagpaul, P.S. and Pant, N. (1993), Cross-national assessment of specialization patterns in chemistry. *Scientometrics*, **27** (2), 215-235.

Full Text: [1993\Scientometrics27, 215.pdf](1993/Scientometrics27,%20215.pdf)

Abstract: In this study, the specialization profiles of eleven countries are compared along two interconnected but distinct dimensions of research, viz. publication output and citation impact in nine subfields of chemistry. The data for comparative analysis were taken from Scientometric Datafiles. 1 Since raw counts of publications and citations are confounded by the size of the countries and the size of subject fields, cross-national comparison is made, using relative indicators - activity index and attractivity index. The subfields of relative strength and weakness for these countries are identified from the values of these indicators. The similarity structure of specialization profiles of the eleven countries is mapped, using hierarchical cluster analysis and multidimensional scaling. This mapping leads to the representation of chemistry as it is structured by the dynamics of national science policies of these countries.

Keywords: Analysis, Chemistry, Citation, Citations, Cluster Analysis, Comparison, Dynamics, Fields, Indicators, Output, Publication, Publications, Representation, Research, Scaling, Science, Similarity, Size, Structure

? Martens, B. and Saretzki, T. (1993), Conferences and courses on biotechnology - Describing scientific communication by exploratory methods. *Scientometrics*, **27** (3), 237-260.

Full Text: [1993\Scientometrics27, 237.pdf](1993/Scientometrics27,%20237.pdf)

Abstract: The importance of conferences, courses, workshops, and other kinds of scientific meetings is still growing, especially in highly dynamic or multidisciplinary fields of knowledge. Since these meetings are usually the first occasion of communicating scientific findings, it seems worthwhile to use data on conferences in order to depict trends in science and technology, at an early point of time. Nevertheless, only a few studies on these types of scientific and technological communication were undertaken until now. One prominent example for the relevance of conferences and for the necessity of some monitoring is the field of the “new” biotechnology. We followed a “conference approach” by using data on 4.674 meetings that took place in the time span 1984-90. Content analytic methods (a coding scheme of 70 categories) seemed to be appropriate, according to the textual type of data (information about the meetings, mostly programs). Distributions of categories show specific features and multiple correspondence analyses of concatenated Burt matrices of the categories. differentiated to the years provide a broad overview of biotechnological conferences and other types of meetings in the eighties. Connections between fields of knowledge and applications or certain characteristics of the meetings can be summarized in five clusters of features which are relatively stable within the time frame of investigation.

Keywords: Biotechnology, Coding, Communication, Conferences, First, Information, Investigation, Knowledge, Methods, Multidisciplinary, Relevance, Science, Science and Technology, Technology, Trends, Workshops

? Mulford, C.L., Waldnerhaugrud, L. and Gajbhiye, H. (1993), Variables associated with agricultural scientists work alienation and publication productivity. *Scientometrics*, **27** (3), 261-282.

Full Text: [1993\Scientometrics27, 261.pdf](1993/Scientometrics27,%20261.pdf)

Abstract: This study focuses on work alienation and publication productivity of agricultural scientists in two international research centers. Previous research has been criticized because the variables emphasized have typically been poorly correlated with publication productivity. Additionally, although work alienation of professionals has received considerable attention in the literature, seldom has it been included in empirical studies of publication productivity. Results indicate two perceptions of structure, centralization and formalization, are significantly correlated with work alienation, but less so with publication productivity. Work alienation is significantly, but modestly, correlated with publication productivity. In a multiple regression analysis, work alienation proved to be less important than perceived centralization. Implications for supervisors of scientific staffs include inducing the layers of hierarchy and empowering staff by giving them a voice in research goals and organizational operations.

Keywords: Analysis, Formalization, International, Literature, Publication, Regression Analysis, Research, Structure, Work

? Steinberg, J.J. (1993), The state of biomedical radiation research as demonstrated by publications, funding and manpower activity - An analytical example of utilizing online medical informatics. *Scientometrics*, **27** (3), 283-294.

Full Text: [1993\Scientometrics27, 283.pdf](1993/Scientometrics27,%20283.pdf)

Abstract: The biomedical radiation research community has important goals. Research, risk assessment, preventative health and safety are some of its responsibilities. It is surprising that radiation research is growing only at 70% of the yearly MEDLINE database. Funding is predictably underfunded (89% of expected) given its high percentage of research with animals and cells (127% (MEDLINE = 100%)) vs. radiation’s lower percentage of human studies (60%). Manpower studies demonstrate 4500 Ph.D.’s since 1960. 50% are in physics, 17% chemistry, and 11% biology. Biochemistry, pharmacology, microbiology, genetics, pathology and psychology contribute less than 3%. These indicators show activity in radiation research, yet deficits.

Keywords: Assessment, Biology, Biomedical, Chemistry, Community, Database, Genetics, Health, Human, Indicators, Journals, Microbiology, Oncology, Pathology, Psychology, Radiation, Research, Responsibilities, Risk, Risk Assessment, Safety

? Sylvain, C. (1993), Canadian research activity in aquaculture: A bibliometric analysis. *Scientometrics*, **27** (3), 295-316.

Full Text: [1993\Scientometrics27, 295.pdf](1993/Scientometrics27,%20295.pdf)

Abstract: Analysis of the Canadian publications in the field of aquaculture reveals that Canada is one of the word’s major contributors in this area. This confirms that Canada’s experties in science and technology often finds its stimulus in its resource-based industries. Several bibliometric indicators were used to enlighten the peculiar features of the Canadian research system. These include the channels of communication used by scientists, the authorship pattern, the level of collaboration, the identification of the institutions in which the research is performed and the uneven research effort distribution inside the country. The relevance of such quantitative measures for science policy-making is emphasized. The present study shows how bibliometric analysis, by describing the actual strengths and weaknesses of Canadian research and identifying the agents of this research activity, might foster a better understanding of the Canadian research enterprise as a whole.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Canada, Collaboration, Communication, Countries, Identification, Indicators, Institutions, Journals, Publications, Quality, Relevance, Research, Science, Science and Technology, Technology, Understanding

? Lewison, G., Fawcettjones, A. and Kessler, C. (1993), Latin-American scientific output 1986-91 and international co- authorship patterns. *Scientometrics*, **27** (3), 317-336.

Full Text: [1993\Scientometrics27, 317.pdf](1993/Scientometrics27,%20317.pdf)

Abstract: Results are presented of a study covering 1986-91 of the scientific output of Latin American nations. The distribution of the output within the countries is shown: in most countries there is a high concentration in the national capital. The papers co-authored with scientists from other countries are also examined. There has been a notable rise in both the number and proportion of papers co-authored within the region, with the USA and Canada, and, especially, with the countries of the European Community, where a programme of International Scientific Co-operation, to promote just such links, has been active since the mid-1980s in many Latin American countries.

Keywords: Canada, Countries, Nations, Papers, Sciences, Scientific Output, Universities, USA

Notes: CCountry

? Rousseau, R. (1993), Measuring concentration - Sampling design issues, as illustrated by the case of perfectly stratified samples. *Scientometrics*, **28** (1), 3-14.

Full Text: [1993\Scientometrics28, 3.pdf](1993/Scientometrics28,%203.pdf)

Abstract: Using the artificial example of perfectly stratified samples, we have shown the effect different sampling designs have on the determination of concentration values. More concretely, we have studied the following four cases: sampling of items in the case the number of sources is known (we have further considered the cases when there are ‘many’ items in every source and when this is not so), sampling of items in the case the number of sources is unknown, and finally, sampling of sources.

? Luukkonen, T., Tijssen, R.J.W., Persson, O. and Sivertsen, G. (1993), The measurement of international scientific collaboration. *Scientometrics*, **28** (1), 15-36.

Full Text: [1993\Scientometrics28, 15.pdf](1993/Scientometrics28,%2015.pdf)

Abstract: A growing science policy interest in international scientific collaboration has brought about a multitude of studies which attempt to measure the extent of international scientific collaboration between countries and to explore intercountry collaborative networks. This paper attempts to clarify the methodology that is being used or can be used for this purpose and discusses the adequacy of the methods. The paper concludes that, in an analysis of collaborative links, it is essential to use both absolute and relative measures. The latter normalize differences in country size. Each yields a different type of information. Absolute measures yield an answer to questions such as which countries are central in the international network of science, whether collaborative links reveal a centre - periphery relationship, and which countries are the most important collaborative partners of another country. Relative measures provide answers to questions of the intensity of collaborative links.

Keywords: Analysis, Collaboration, Cooperation, Information, International, Methodology, Methods, Network, Policy, Science, Science Policy, Scientific Collaboration, Size

? Okubo, Y. (1993), Comments on some of the statements in the article - The measurement of international scientific collaboration by Luukkonen, T., Tijssen, R.J.W., Persson, O., Sivertsen, G. *Scientometrics*, **28** (1), 37-39.

Full Text: [1993\Scientometrics28, 37.pdf](1993/Scientometrics28,%2037.pdf)

? Yuthavong, Y., Phornsadja, K., Chungcharoen, A., Eisemon, T. and Davis, C. (1993), Communication strategies in tissue culture and seed research in Thailand. *Scientometrics*, **28** (1), 41-60.

Full Text: [1993\Scientometrics28, 41.pdf](1993/Scientometrics28,%2041.pdf)

Abstract: Thailand has a growing demand for improved science-based technologies in the agricultural sector. Traditionally strong in agricultural research, Thailand is encouraging agricultural applications of biotechnology through focused research funding. This article provides a brief account of the status of scientific research in the Thai orchid and seed industries, and examines communication behavior of researchers and innovators in Thai universities, research institutions and firms. Researchers produce relatively few written communications in tissue culture and seed technologies, and technology diffusion relies mainly on personal interactions between the researchers, intermediaries, and users of innovations.

Keywords: Behavior, Biotechnology, Communication, Communications, Culture, Demand, Diffusion, Institutions, Research, Research Funding, Scientific Research, Sector, Technologies, Technology, Thailand, Universities

Rogers, L.A. and Anderson, J. (1993), A new approach to defining a multidisciplinary field of science: The case of cardiovascular biology. *Scientometrics*, **28** (1), 61-77.

Full Text: [1993\Scientometrics28, 61.pdf](1993/Scientometrics28,%2061.pdf)

Abstract: This paper describes a new and objective method for tackling the problem of defining a multidisciplinary research area for bibliometric analysis. The test field was cardiovascular biology. A three stage process was adopted in setting a boundary around this research field: 1. Appropriate sections of a hierarchical subject classification scheme, Medical Subject Headings (MeSH), were developed into a ‘MeSH filter’ through which papers indexed in MEDLINE were screened. 2. A panel of cardiovascular experts reviewed the core set of classification terms, identifying irrelevant and missing areas, facilitating the development of a more sophisticated ‘filter. 3. The definition was validated using publication lists from research departments with a known interest in cardiovascular research. This iterative process resulted in a definition of the field which captured basic and clinical research papers from the international biomedical research community and which was recognisable to experts in the field of cardiovascular research. Importantly, the field boundary also excluded publications which were not relevant to cardiovascular research. The process of involving experts in shaping the field definition also yielded two intangible, but key benefits: (a) it lent credibility to subsequent analyses, the results of which were to be presented to policy-makers in cardiovascular biology, and (b) it served to shape consensus among the cardiovascular experts on the full range of scientific disciplines that are relevant to their field. Analysis of international publishing in cardiovascular research revealed that whilst the UK and US dominate in total numbers of papers, the relative emphasis on cardiovascular research in these countries (as a proportion of all biomedical publishing) is actually quite low, and declining. Japan and Germany in contrast appear to give greater emphasis to cardiovascular research in their national portfolios of biome-dical science, and between 1988-1991 Japan established a marked increase in activity.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Biology, Biomedical, Biomedical Publishing, Biomedical Research, Cardiovascular, Classification, Clinical, Clinical Research, Community, Consensus, Credibility, Development, Germany, International, Japan, MEDLINE, Multidisciplinary, Papers, Publication, Publications, Publishing, Research, Science, UK, US

? Uzun, A., Menard, A. and Ozel, M.E. (1993), Citation status of Turkish physics publications in foreign-journals - A global analysis. *Scientometrics*, **28** (1), 79-87.

Full Text: [1993\Scientometrics28, 79.pdf](1993/Scientometrics28,%2079.pdf)

Abstract: We have studied the citation rates and characteristics of 572 Turkish physics publications that appeared in the source journals listed in the Science Citation Index (SCI) for the period 1982-1990 to drive the following results: The papers appeared in a set of 94 journals, and 68% of the total output went to 21 of these, half of which are journals of high impact. On the average, papers from Turkey that appeared in the American and European journals are cited at rates higher than the corresponding “average” papers. There has been a substantial shift of Turkish papers from European journals to American journals over the last few years. These changes are an example of the process by which science in a less developed country becomes integrated into the word scientific community.

Keywords: Changes, Citation, Community, Drive, European Physics, Journals, Output, Papers, Publications, SCI, Science, Science Citation Index, Turkey

Notes: CCountry

Rinia, E.J., Delange, C. and Moed, H.F. (1993), Measuring national output in physics: Delimitation problems. *Scientometrics*, **28** (1), 89-110.

Full Text: [1993\Scientometrics28, 89.pdf](1993/Scientometrics28,%2089.pdf)

Abstract: In a study of the Dutch publication output in physics we tested methods of delimitating fields by journal categories in the Science Citation Index (SCI) compared to the classification of individual publications into subfields in the subject specific database Physics Briefs (PHYS). Different methods of measuring national scientific output were compared as well. In this paper we report the main findings on these issues, based on a study of six selected subfields in physics. The main conclusion with respect to the use of different classification methods is that in most of the selected fields in physics the method which delimitates fields by journal categories yields an incomplete picture of the output of a country. Particularly because this method neglects a considerable number of articles published in general journals. With respect to different methods of counting publications it was corroborated by the Dutch data in Physics briefs that: 1. so-called ‘integer counted’ world shares are very much influenced by the degree of ‘internationalisation’ and 2. ‘first author counting’ gives a satisfactory approximation of ‘fractional counting’. Citation indicators based on ‘first author counting’, however, may be distorted in fields with a large fraction of international co-authored publications

Keywords: Bibliometric Assessment, Classification, Cooperation, Database, First, Indicators, International, Journal, Journals, Methods, Publication, Publications, SCI, Science, Science Citation Index, Scientific Output, UK Scientific Performance

? Tijssen, R. (1993), A scientometric cognitive study of neural network research: Expert mental maps versus bibliometric maps. *Scientometrics*, **28** (1), 111-136.

Full Text: [1993\Scientometrics28, 111.pdf](1993/Scientometrics28,%20111.pdf)

Abstract: This paper reports on a quantitative analytical methodology which deals with perceptions of scientific experts regarding the intellectual shape and contents (‘cognitive structure’) of their scientific domain. This study examines the method’s utility for studying expert views in general, and, more specifically, its strengths and weaknesses as a tool for improving validation studies of bibliometric maps involving subject experts. The main premise is that expert views are based on their internal knowledge structures (‘mental schemes’) of which relevant features can be captured in quantitative data. This approach allows a rigorous and systematic way of studying mental schemes across subject experts. Spatial representations of their data (‘mental maps’) provide insight in properties underlying those knowledge structures. Data from different experts are reconciled to construct a ‘common’ mental map which displays a group view. This study includes a test to establish the validity of individual mental maps and common mental maps. The methodology is applied to the views of 14 researchers in the field of neural network research and related areas. Key-findings are: (i) mental maps can provide valid representations of expert mental schemes, (II) experts sharing the same subject field are more likely to share views, (iii) expert judgements of bibliometric maps are affected by the structure of their own mental schemes, as well as (iv) by their views regarding the utility of those maps, and (v) common mental maps and a bibliometric co-word map based on the same set of items differ significantly, showing a resemblance on main features only.

Keywords: Bibliometric, Foundations, Information-Science, Knowledge, Methodology, Network, Neural Network, Research, Structure, Utility, Validation, Validity

Braun, T., Glänzel, W. and Schubert, A. (1993), Scientometric indicators datafiles. *Scientometrics*, **28** (2), 137-150.

Full Text: [1993\Scientometrics28, 137.pdf](1993/Scientometrics28,%20137.pdf)

Abstract: The structure of a comprehensive set of publication output and citation impact indicators is reviewed. Hints to the application of the indicators are given in one, two and more dimensions.

Keywords: Basic Research, Citation, Countries, Facts, Figures, Indicators, Life Sciences, Newest Version, Physics, Publication, Publication Output, Relative Citation Impact, Structure, World Flash

? Norris, R.P. (1993), Authorship patterns in CJNR - 1970-1991. *Scientometrics*, **28** (2), 151-158.

Full Text: [1993\Scientometrics28, 151.pdf](1993/Scientometrics28,%20151.pdf)

Abstract: This article looks at authorship patterns in CJNR from 1970 to 1991. A tally was taken of the number of single, double and multiple authorships for each year which, in turn, were combined into one seven year and three five year intervals. Frequency counts were converted into percentages, chi-squares were computed, and author/article ratios were calculated for each year. Results revealed a decrease in the number of single authored articles and an increase in the number of co- and multiple authored articles from 1982 on. The author/article ratios fluctuated somewhat, but, overall showed marked increases. It was tentatively concluded that nursing is not unlike other disciplines, that it too is experiencing changes in authorship patterns. Reasons for the changes are tendered along with suggestions for further research.

Keywords: Authorship, Changes, Clinical Research, Intervals, Journals, Multiple Authorship, Nursing, Research, Trend

? Souza, G.S., Cruz, E.R. and Quirino, T.R. (1993), The measurement and assessment of quality in agricultural-research institutions. *Scientometrics*, **28** (2), 159-182.

Full Text: [1993\Scientometrics28, 159.pdf](1993/Scientometrics28,%20159.pdf)

Abstract: We present the measure of quality introduced by the review team of Embrapa to evaluate its research projects. The quality measurement scheme comprises four different dimensions (External Validity, Internal Validity, Institutional Adequacy, and Formal Adequacy). The quality measurements are used as dependent variables in a multivariate effort to identify important factors necessary to improve overall as well as specific quality aspects.

Keywords: Measurement, Quality, Research, Review

? Chen, Y.S., Chong, P.P. and Tong, Y.G. (1993), Theoretical foundation of the 80/20 rule. *Scientometrics*, **28** (2), 183-204.

Full Text: [1993\Scientometrics28, 183.pdf](1993/Scientometrics28,%20183.pdf)

Abstract: A rigorous analysis of the 80/20 rule is made using an index for the observed values of the variables. Three important findings are identified. First, a sufficient condition is provided for Burrell’s inverse relationship between minimum holdings and average circulation rate. Second, an indexed version of Lotka’s law is used to derive a sufficient condition for Egghe’s finding on the 80/20 rule. Third, through the computer simulations of the Simon-Yule model of Lotka’s law, we identify the entry rate of new holdings as well as the number of circulations when the entry rate is a decreasing function to be crucial factors for the pattern of the 80/20-type curve.

Keywords: Analysis, Bradford Law, Function, Index Approach, Law, Model, Zipf Law

? Willems, J. and Woudstra, E. (1993), The use by biologists and engineers of nonspecialist information-sources and its relation to their social involvement. *Scientometrics*, **28** (2), 205-216.

Full Text: [1993\Scientometrics28, 205.pdf](1993/Scientometrics28,%20205.pdf)

Abstract: Earlier investigations showed that many academics obtain information pertaining their own field of science from the general massmedia, such as newspapers. Who are those scientists? Is there a relation between the social engagement and the use of non-specialist information sources? We investigated the social engagement of biologists and engineers in correlation to their use of general massmedia in the Netherlands. Biologists find their work social significant, most of engineers do not. Many biologists are members of non-specialist organizations, subscribe to non-specialist journals about science and participate in non-scientific activities related to their work. Most engineers do not. Many members of both groups (biologists and engineers) use non-specialist informations sources like general science magazines and national newspapers to obtain information about their own field of science. And most biologists and engineers did so to obtain information about new developments in their own field and in related fields. We did not find any correlation between the social engagement of scientists and their use of non-specialist information sources. Most scientists use them.

Keywords: Information, Journals, Science, The Netherlands, Work

? Lewison, G. (1993), The contribution of European-Community less favored region research outputs to economic and social cohesion. *Scientometrics*, **28** (2), 217-229.

Full Text: [1993\Scientometrics28, 217.pdf](1993/Scientometrics28,%20217.pdf)

Abstract: Data are presented on the scientific output from 1985-92 of the Less Favoured Regions (LFRs) of the European Community as recorded in the Science Citation Index. The use of postcodes makes it easier to identify papers from LFRs and they are now nearly universal (over 95%). LFR output has grown since 1985 from 5% to nearly 8% of the EC total, and there is much more trans-national co-authorship between ones in different countries though it is still at a low level. There is also increasing co-publication between scientists from LFRs and the rest of the EC (More Favoured Regions, MFRs), both within the same countries and trans-nationally. Selective retrieval of papers by their address keywords shows that the LFRs are relatively strong in the physical, rather than the life, sciences and that the major areas of growth in recent years have been engineering, earth/space sciences and physics.

Keywords: Co-Authorship, Coauthorship, EC, Growth, Indicators, Life, Papers, Science Citation Index, Sciences, Scientific Output

? Bonitz, M. (1993), Schubert, Andras Wins the 1993 Derek-John-Desollaprice-Award. *Scientometrics*, **28** (3), 233-235.

Full Text: [1993\Scientometrics28, 233.pdf](1993/Scientometrics28,%20233.pdf)

? Hall, D.H. (1993), The science-industry interface in the petroleum-industry - Correlation of time-series of indicators and their spectra, and growth modeling. *Scientometrics*, **28** (3), 237-286.

Full Text: [1993\Scientometrics28, 237.pdf](1993/Scientometrics28,%20237.pdf)

Abstract: Petroleum production and exploration, used as petroleum industry indicators, and accumulation of petroleum-related geoscience literature, used as a science indicator, were compared by several means to gauge the degree of interaction between science and the industry in the period 1934-1990. Methods of comparison employed were: time domain correlations and crosscorrelation, correlations of spectra using coherence and crosspower spectra, and growth-modelling of the indicators. A fifty-year exploration cycle was found, beginning about 1945. Principal features of this cycle seem to coincide with prominent features in the time series for geoscience literature, and both of these variables are correlated with petroleum production. All three variables appear to have been determined ultimately by economic and political events which affected the petroleum industry. All of them show long-period cycles which coincide with the fourth Kondratiev cycle and the beginning of the fifth Kondratiev. The longest time series used (petroleum production in the United States, 1860-1990) shows long-period cycles matching the third, fourth and fifth Kondratiev cycles.

Keywords: Comparison, Correlations, Geoscience, Indicator, Indicators, Interaction, Literature, Modeling, Science, United States

? Gupta, D.K. (1993), Collaborative research trend in exploration geophysics. *Scientometrics*, **28** (3), 287-296.

Full Text: [1993\Scientometrics28, 287.pdf](1993/Scientometrics28,%20287.pdf)

Abstract: A comprehensive database, the Cumulative Index of Geophysics for the period 1936-1985 was analysed to study collaborative and authorship trends in exploration geophysics. A total of 3,417 publications in Geophysics and 1,318 publications in Geophysical Prospecting comprise the database. About 56.2% of all the publications were found to be single-authored items. The number of single-authored items has been gradually declining from 1936 to 1985. Authorship per item for the period was found to be 1.6 which has increased from 1.17 per item during 1936-1950 to 1.9 per item during 1981-1985. The results of this study reveal that like in any other discipline in sciences, collaboration in exploration geophysics research has also been increasing during the period 1936-1985.

Keywords: Authorship, Collaboration, Database, Publications, Research, Sciences, Scientific Co-Authorship, Trends

? Sancho, R., Bernal, G. and Galvez, L. (1993), Approach to the Cuban scientific activity by using publication based quantitative indicators (1985-1989). *Scientometrics*, **28** (3), 297-312.

Full Text: [1993\Scientometrics28, 297.pdf](1993/Scientometrics28,%20297.pdf)

Abstract: An estimation about Cuban scientific productivity based on output indicators during the period 1985-1989 is provided. Nine international bibliographic databases and three Cuban repertories have been used. Except for journal articles, no other type of Cuban document gets worldwide recognition as they are not generally included in the international databases. The greater effort in research is made in Agriculture, Biomedicine, Chemistry and Engineering, but this last topic does not reach international visibility, since the majority of its results are published in local journals. The Cuban contribution to the “mainstream” of world science is increasing annually. Collaboration in high level research projects existed mainly between Cuba and either USSR, German Democratic Republic and Italy. The most productive Cuban institutions in collaborative programs are the Havana University and the Academy of Sciences.

Keywords: Countries, Indicators, Institutions, International, Italy, Journal, Journal Articles, Journals, Research, Science

? Senter, R. (1993), Factors in American State government spending on research-and-development. *Scientometrics*, **28** (3), 313-327.

Full Text: [1993\Scientometrics28, 313.pdf](1993/Scientometrics28,%20313.pdf)

Abstract: This paper investigates factors that lead state governments in the United States to spend on research and development and research and development plant. Data come from a national survey of such spending. Regression analysis is used. Findings include the following: the relative wealth of a state, as measured by its tax capacity, predicts some of such spending, the level of a state’s taxation, as measured by its tax effort, predicts some of such spending, and the political party composition of a state predicts some of such spending. By contrast, a state’s economic difficulty, as measured by its unemployment rate, has almost no relationship to such spending.

Keywords: Analysis, Capacity, Development, Economic-Development, Lead, Plant, Policy, Research, Research and Development, Science, Survey, Taxation, Technology Programs, United States, United-States

? Maclean, J. and Janagap, C. (1993), The publication productivity of International Agricultural Research Centers. *Scientometrics*, **28** (3), 329-348.

Full Text: [1993\Scientometrics28, 329.pdf](1993/Scientometrics28,%20329.pdf)

Abstract: The literature output over one year, 1990, of 22 International Agricultural Research Centers (IARCs), including 16 Consultative Group on International Agricultural Research (CGIAR) centers, was examined. Total output of the IARCs was 1,694 items, of which on average 42% were primary (refereed) literature, 24% were reports and monographs, 18% proceedings papers, 8% book chapters, and 8% semitechnical/popular literature. Total literature production from the IARCs is similar in magnitude to that of FAG, There were 1,230 internationally recruited scientists in the IARCs, with an average annual productivity of 1.38 items per scientist, including 0.58 primary literature articles. There was no correlation between scientific productivity and numbers of scientists in a center. However, there was a significant positive correlation between scientific productivity and center budget, indicating higher efficiency in the larger centers. In view of the nature of IARCs’ literature output, we argue that IARCs should reject the trend for scientists to be assessed only by citations in “core” primary literature, and that IARCs should set up an international standard, perhaps based on the present proportionality of types of their literature output in order to assess IARC individual scientists and the “health” of their institutional output.

Keywords: Budget, Citations, Efficiency, International, Literature, Papers, Primary, Standard

? Herbstein, F.H. (1993), Measuring “publications output” and “publications impact” of faculty members of a university chemistry department. *Scientometrics*, **28** (3), 349-373.

Full Text: [1993\Scientometrics28, 349.pdf](1993/Scientometrics28,%20349.pdf)

Abstract: The publication and citation records of a group of 34 senior members of the faculty of the Department of Chemistry at Technion-Israel Institute of Technology over the period 1980-90 have been analyzed under the contention that dealing with a small group makes it possible for one to pay adequate attention to the methodology of the measurement and analysis processes. Choosing the most suitable index for measuring “Publications Output” has been considered in detail, it is suggested that it is essential to make allowances for both the number of co-authors and for the lengths of publications in order to obtain a more valid measure than is provided by a simple count of equally-weighted publications. Analogously it is argued that simple citation counts provide an inadequate measure of the impact that publications make on the group outside the authors’ immediate circle and thus that it is necessary to subtract self citations and divide the credit for a citation among the co-authors of the publication. Results of the analysis show that in agreement with all previous findings a few members (perhaps less than 20%) produce more than half the publications and receive more than half the citations of the Group as a whole.

Keywords: Analysis, Authorship, Citation, Citation Counts, Citations, Co-Authors, Faculty, Frequency, Measurement, Methodology, Publication, Publications, Records, Science, Self, Small

? Giorgi, E.P. (1993), Long-term analysis of citation counts at the microlevel. *Scientometrics*, **28** (3), 375-386.

Full Text: [1993\Scientometrics28, 375.pdf](1993/Scientometrics28,%20375.pdf)

Abstract: Analysis over a 13 year period of citation counts to research papers in pursuit of a new scientific hypothesis on the mechanism of action of oestrogen hormones, which therefore could be defined at the micro-level, revealed that during a period of expansion of the field there was an overall fall in mean citation counts, even to papers by with hindsight still successful groups. This fall appeared to be related to a relatively greater increase in the number of papers to be cited than in the number of citing papers.

Keywords: Citation, Citation Counts, Mechanism, Mechanism of Action, Papers, Research

? Stephan, P.E. and Levin, S.G. (1993), Age and the Nobel-Prize revisited. *Scientometrics*, **28** (3), 387-399.

Full Text: [1993\Scientometrics28, 387.pdf](1993/Scientometrics28,%20387.pdf)

Abstract: This paper analyzes the relationship between age and productivity for Nobel prize winners in science during the period 1901-1992. The relationship found is field dependent as well as dependent upon the definition used to measure the age at which the ward-winning work was done. The results suggest that although it does not require extraordinary youth to do prize-winning work, the odds decrease markedly in mid-life and fall off precipitously after age 50, particularly in chemistry and physics. The discussion underscores the problem of drawing conclusions about the age structure of research by examining medians instead of the entire distribution.

Keywords: Chemistry, Life-Cycle, Research, Research Productivity, Science, Scientists, Structure, Work, Youth

? Pouris, A. (1993), Economies of Scale in Science and Technology Agencies. *Scientometrics*, **28** (3), 401-406.

Full Text: [1993\Scientometrics28, 401.pdf](1993/Scientometrics28,%20401.pdf)

Abstract: This study is the first to provide estimates of the economies of scale in science and technology agencies. As such, it sheds new light on issues of interest to policy-makers. The study identifies that there are strong economies of scale to be captured in organisations with budgets less than $200 million. The least efficient agency in the study requires 136 times more input per unit of output than the most efficient one. The study was unable to identify diseconomies of scale up to the range of $3 billion. The policy implications for countries which are small in science in particular, are discussed.

Keywords: Estimates, First, Policy, Science, Science and Technology, Small, Technology

? Bonitz, M. (1994), The multidimensional space of scientometrics: Price, Derek, John, Desolla Awards 1984-1993. *Scientometrics*, **29** (1), 3-14.

Full Text: [1994\Scientometrics29, 3.pdf](1994/Scientometrics29,%203.pdf)

Abstract: Nine scientists have been so far awarded the Derek de Solla Price medal which was founded by the journal Scientometrics after the premature death of Derek John de Solla Price in 1983. The study of their most cited papers and other aspects of their scientific work provides good insight into the various dimensions of the developing field of scientometrics.

Keywords: 1989 Price, Derek, Desolla, Citation Impact, Death, Documents, Foundations, Information-Science, Journal, Journals, Papers, Quantitative Aspects, Recipient, Relative Indicators, Scientific Publications, Scientometrics, Work

? Wagnerdobler, R. (1994), The frequency-distribution of legal decision citations in the German Jurisdiction. *Scientometrics*, **29** (1), 15-26.

Full Text: [1994\Scientometrics29, 15.pdf](1994/Scientometrics29,%2015.pdf)

Abstract: This investigation has three aims: 1. To direct the attention of scientometrics to the widespread use of citation indexes by practising lawyers. The analysis of this practice is of special value for comparative studies in scientometrics and informetrics. 2. To examine the frequency distribution of legal decision citations in the German jurisdiction. 3. To test whether these frequency distributions depend exclusively on the density of citations between documents of a database, as stated by D. Price.

Keywords: Analysis, Citation, Citation Indexes, Citations, Database, Informetrics, Investigation, Jurisdiction, Legal, Practice, Scientometrics

Martin, B.R. (1994), British Science in the 1980S - Has the Relative Decline Continued. *Scientometrics*, **29** (1), 27-56.

Full Text: [1994\Scientometrics29, 27.pdf](1994/Scientometrics29,%2027.pdf)

Abstract: In previous articles, the author and his colleagues have shown that British science declined relative to other countries during the 1970 and more slowly during the early 1980s. More recently, the author examined figures for 1981-85 produced by the Information Science and Scientometrics Research Unit (ISSRU) and showed that they were consistent with other evidence on Britain’s relative decline. However, those latter findings and the methodology used to derive them have been criticised by Braun and his colleagues at ISSRU, and by Leydesdorff and Kealey. This paper begins by examining these criticisms to establish whether there are any grounds for revising the previous conclusion that British science has been slipping in relation to other countries. It then analyses the latest publication and citation statistics. It also presents new data on highly cited papers and on the national distribution of Nobel Prizes. The paper concludes that, although a few isolated indicators might be taken to suggest that British science has been growing in some absolute sense, the great weight of evidence points to a continuing relative decline.

Keywords: Articles, Bibliometric Assessment, Citation, Evidence, Growth, Indicators, Methodology, Papers, Publication, Science, Scientometrics, Statistics, UK Scientific Performance

Abt, H.A. (1994), Report on the manuscript entitled British science in the 1980s: Has the relative decline continued. *Scientometrics*, **29** (1), 57-58.

Full Text: [1994\Scientometrics29, 57.pdf](1994/Scientometrics29,%2057.pdf)

Coleman, S.R. (1994), Disciplinary variables that affect the shape of Bradford’s bibliography. *Scientometrics*, **29** (1), 59-81.

Full Text: [1994\Scientometrics29, 59.pdf](1994/Scientometrics29,%2059.pdf)

Abstract: The influence of various factors upon the shape of Bradford’s bibliograph was assessed through an examination of 16 bibliographies, of which ten were comprehensive. We obtained a curvature score for each bibliograph plotted in a standard landscape format so as to permit comparison, we found that the amount of concave-up curvature (‘convexity’): (a) is negatively correlated with a bibliography’s overall publication density, (b) depends on the status (‘technical’ vs. ‘nontechnical’) of the disciplinary source of a bibliography, with technical disciplines showing less convexity, and (c) is complexly affected by the historical changes in the discipline. Findings are discussed in the context of questions about the graphical formulation of Bradford’s Law.

Keywords: Bibliographies, Changes, Comparison, Examination, Law, Publication, Standard

? Grupp, H. and Hinze, S. (1994), International orientation, efficiency of and regard for research in east and West-Germany: A bibliometric investigation of aspects of technology genesis in the United Germany. *Scientometrics*, **29** (1), 83-113.

Full Text: [1994\Scientometrics29, 83.pdf](1994/Scientometrics29,%2083.pdf)

Abstract: The efficiency of areas of science was evaluated using the DEA method. Areas achieving a maximum orientation or regard of international publication are rated as efficient. The areas of reproductive medicine, organic and inorganic chemistry in the former Federal Republic can thus be regarded as efficient areas of science. No area of scientific research in the former East Germany was able to achieve the optimum. The determinant in this connection is the adverse situation with respect to international orientation whilst no substantial difference in regard for further research could be detected between East and West German research.

Keywords: Chemistry, Efficiency, Germany, Indicators, International, Medicine, Publication, Research, Science, Scientific Research

Peters, H.P.F. and Vanraan, A.F.J. (1994), A bibliometric profile of top-scientists: A case study in chemical engineering. *Scientometrics*, **29** (1), 115-136.

Full Text: [1994\Scientometrics29, 115.pdf](1994/Scientometrics29,%20115.pdf)

Abstract: We carefully selected a group of chemical engineering scientists internationally recognized as ‘top-scientists’ in their field. A method has been developed to systematically compare bibliometric characteristics of these top-scientists with an ‘average scientist’ in chemical engineering. This method also includes citation-analysis of books and proceedings. ne results show a very clear ‘bibliometric profile’. First, top-scientists reach the maximum of their received citations about a year earlier. Second, they are cited significantly more than the average scientist. Third, top- scientists’ references are more numerous and, fourth, they concern more recent literature. Our fifth findings is that the journals used by top-scientists for their publications are representative for the field of chemical engineering as a whole. But they differ in specific aspects significantly from the ‘average’ journal structure in chemical engineering: the published work of top-scientists is both ‘general’ as well as more specialistic than the average work in chemical engineering

Keywords: Bibliometric, Citation Analysis, Citations, Impact, Indicators, Journal, Journals, Literature, Physics, Publications, Research Performance, Structure, Tool, Work

? Teitel, S. (1994), Patents, research-and-development expenditures, country size, and per-capita income: An international comparison. *Scientometrics*, **29** (1), 137-159.

Full Text: [1994\Scientometrics29, 137.pdf](1994/Scientometrics29,%20137.pdf)

Abstract: Conceptual and data problems make the selection of science and technology indicators difficult. It has also proven hard to link measures of scientific and technological activity with economic development. In this paper, statistically significant results are obtained by regressing one science and technology output indicator: patents granted to residents, with R & D expenditures and the stock of potential scientists and engineers. Statistically significant results are also obtained by regressing the same dependent variable onto population size and income per capita. The econometrically established patterns tend to corroborate previously formulated hypotheses and could be used, it is suggested, for policy analysis and projections.

Keywords: Analysis, Development, Economic Development, Economic-Development, Indicator, Indicators, Patents, Policy, Policy Analysis, Population, Potential, Science, Science and Technology, Size, Technological Activity, Technology, Technology Indicators

? Kyvik, S. and Larsen, I.M. (1994), International Contact and Research Performance. *Scientometrics*, **29** (1), 161-172.

Full Text: [1994\Scientometrics29, 161.pdf](1994/Scientometrics29,%20161.pdf)

Abstract: The scope of this article is to illuminate the relationship between degree of international contact and research performance among researchers in small countries. Comparisons are done between the natural, medical and social sciences, technology and the humanities. Three indicators on international contact are used: a) an index on contact frequency, b) type of conference attendance, and c) long-term research stays abroad. There is a relatively strong correlation between contact frequency and international publishing activity in all fields of learning. Researchers who were invited to present a paper by conference organizers were considerably more productive than those who gave a paper on their own initiative, and this latter group was in turn much more productive than those researchers who attended without papers. Contrary to other forms of contact, long-term research stays abroad have a very small independent effect on international publishing.

Keywords: Humanities, Indicators, International, Learning, Medical, Papers, Publishing, Research, Research Performance, Sciences, Small, Social Sciences, Technology

? Schubert, A. (1994), A dictionary of scientific quotations: Mackay, AL. *Scientometrics*, **29** (1), 173-177.

Full Text: [1994\Scientometrics29, 173.pdf](1994/Scientometrics29,%20173.pdf)

? Yamazaki, S. (1994), Research activities in life sciences in Japan. *Scientometrics*, **29** (2), 181-190.

Full Text: [1994\Scientometrics29, 181.pdf](1994/Scientometrics29,%20181.pdf)

Abstract: The purpose of this survey is to study the present state and an evaluation of research activities in the field of life sciences in Japan. Based on the 5,107 papers from Japan in 1989 CD-ROM of Excerpta Medica, a quantitative analysis to determine the present state of research activities in life sciences was conducted. There were 7 journals in which more than 50 papers by Japanese authors were published. Brain Research stood first. The ranking list of contributed papers demonstrates a preference of Japanese researchers’ interest in international journals from commercial publishers rather than in society journals for the publication of their papers overseas. In view of the number of papers and the paper output per head, research activities of organizations were evaluated. The three national medical schools in Kyushu, Osaka, and Kyoto hold ranked high. A comparison between national medical schools and private medical schools shows that the former have higher productivities. Private medical schools were generally inactive, and they emphasized clinical activities more than research activites.

Keywords: Analysis, Clinical, Comparison, Evaluation, First, International, Japan, Journals, Life, Life Sciences, Medical, Medical Schools, Papers, Publication, Quantitative Analysis, Ranking, Research, Sciences, Society, Survey

Notes: TTopic, CCountry

Nasir, A.M., Hassan, H., Hamid, K.A. and Agha, S.S. (1994), Bibliometric evaluation of agricultural literature published in Malaysia. *Scientometrics*, **29** (2), 191-217.

Full Text: [1994\Scientometrics29, 191.pdf](1994/Scientometrics29,%20191.pdf)

Abstract: A bibliometric analysis of agricultural literature published in Malaysia between 1981-1990 was undertaken. The analysis shed light on the key journals that published agricultural literature, on the forms of publications which are resorted to in the communication of research results, on the subject areas which are well written on and those that have been neglected, on the nature of contributions made by Malaysian authors, on the publishing practice of corporate bodies and on the number of publications produced each year.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bodies, Communication, Countries, Journals, Literature, Practice, Publications, Publishing, Research

? Qin, J. (1994), An investigation of research collaboration in the sciences through the philosophical-transactions 1901-1991. *Scientometrics*, **29** (2), 219-238.

Full Text: [1994\Scientometrics29, 219.pdf](1994/Scientometrics29,%20219.pdf)

Abstract: A sample was selected from The Philosophical Transactions of Royal Society of London to examine the development of collaboration in scientific research from 1901-1991. The variables under study were: changes with time, as reflected in the 19 years sampled, the number of collaborative papers, which were subdivided by number of authors, type of collaboration, and the number of unique departmental subject titles, and the number of authors involved in producing collaborative papers, in which the proportion and the mean number of authors per paper were computed according to type of collaboration. It was found that, while the proportion of collaborative papers fluctuated over the years, the number corresponded to an exponential increase over time. The collaboration in the first half of the century was sporadic but grew rapidly in the second half, especially the collaboration involving many authors from different institutions and countries in the production of a publication. The trend toward interdisciplinarity has become pronounced since the 1960s. The phenomenon was found to be associated with the average number of authors per interdisciplinary paper and the type of collaboration. The limitations of the study are indicated and future studies are suggested.

Keywords: Changes, Collaboration, Development, First, Institutions, Interdisciplinarity, Interdisciplinary, Multiple Authorship, Papers, Publication, Research, Scientific Co-Authorship, Scientific Research

? Dehaan, J., Leeuw, F.L. and Remery, C. (1994), Accumulation of advantage and disadvantage in research groups. *Scientometrics*, **29** (2), 239-251.

Full Text: [1994\Scientometrics29, 239.pdf](1994/Scientometrics29,%20239.pdf)

Abstract: This articles presents a test of the accumulation of advantage (AOA) hypothesis applied to differences in duration of research groups. Data are presented on the collaboration within groups both before and after the implementation of a policy measure. An extensive discussion of the findings is given as well as an elaboration of the AOA hypothesis.

Keywords: Collaboration, Policy, Research

Notes: MModel

Chung, Y.K. (1994), Bradford distribution and core authors in classification systems literature. *Scientometrics*, **29** (2), 253-269.

Full Text: [1994\Scientometrics29, 253.pdf](1994/Scientometrics29,%20253.pdf)

Abstract: By applying of Bradford’s law to analysis of the source documents and their references by classification systems researchers in the world, this paper presents core authors of the field during the period 1981-1990. The findings show that 1) core authors of the international classification systems literature are the Library of Congress, M. Dewey, S. Ranganathan, J. Comaromi, A. Neelameghan, L. Chan and K. Markey, 2) the highly cited authors are linked either to the developers of the classification systems or to a research center, or else they authored the most frequently cited books, and 3) the data confirms to Bradford’s law and the unusual rising tail of Bradford distribution is appeared and explained.

Keywords: Analysis, Classification, International, Law, Literature, Research

? Miquel, J.F. and Okubo, Y. (1994), Structure of international collaboration in science. 2. Comparisons of profiles in countries using a link indicator. *Scientometrics*, **29** (2), 271-297.

Full Text: [1994\Scientometrics29, 271.pdf](1994/Scientometrics29,%20271.pdf)

Abstract: In this article, the behaviors of countries in scientific production activities are investigated using an asymmetrical matrix system to analyze data collected from the Science Citation Index. Examination of international collaboration, intercountry relationships, and domestic scientific output patterns structured by 98 countries in eight principal fields of science reveal diverse aspects of country behaviors. Three asymmetrical matrixes are established and the multidimentional Minimum Spanning Tree technique is applied to classify, visualize and determine the distinctive characteristics of country profiles. Investigations are conducted at both a macro (country behavior) and a micro (particular city behavior) level in order to demonstrate the applicability of the methodology and to obtain global observations of country behaviors. It is argued that these methods contribute to reveal traditions and policies of countries, universities and research organizations as well as that of the international network of scientific exchange. Further usage of these methodologies is advocated for policy analysis.

Keywords: Analysis, Behavior, Collaboration, International, Methodology, Methods, Network, Policy, Policy Analysis, Research, Science, Science Citation Index, Scientific Output, Scientific Production, Universities

? Braun, T., Glänzel, W., Maczelka, H. and Schubert, A. (1994), World science in the eighties - national performances in publication output and citation impact, 1985-1989 versus 1980-1984. 1. All science fields combined, physics, and chemistry. *Scientometrics*, **29** (3), 299-334.

Full Text: [1994\Scientometrics29, 299.pdf](1994/Scientometrics29,%20299.pdf)

Keywords: Facts, Figures, Life Sciences, Newest Version

? Reguant, S. and Casadella, J. (1994), English as Lingua-Franca in geological scientific publications: A bibliometric analysis. *Scientometrics*, **29** (3), 335-351.

Full Text: [1994\Scientometrics29, 335.pdf](1994/Scientometrics29,%20335.pdf)

Abstract: The examination of three samples of geological scientific publications: (A) 9 journals from Western Europe and USA, (B) 10 up-to-date review books, and (C) 3 sections of Volume 127 (1990-1991) of the Zoological Record, shows that the statement that English is now the lingua franca in geological sciences is only in part true, but reflects a desire by many people in the scientific community, a desire which may not yet have been fulfilled.

Keywords: Community, Europe, Examination, Journals, Publications, Review, Sciences, Scientific Publications, USA

? Hinze, S. (1994), Bibliographical cartography of an emerging interdisciplinary discipline: The case of bioelectronics. *Scientometrics*, **29** (3), 353-376

Full Text: [1994\Scientometrics29, 353.pdf](1994/Scientometrics29,%20353.pdf)

Abstract: A bibliometric analysis in the emerging field of bioelectronics, characterised by a high degree of interdisciplinarity, is carried out. Two different techniques - co-classification and co-word analysis - have been used and their results have been compared. The limitations and potentials of these techniques, especially concerning their use for analysing interdisciplinary scientific fields, are discussed. It is found that these techniques enable analyses gaining a first insight into the coarse structure of the field. The advantage of the techniques is their relative simplicity, and the possibility to carry out trend analyses based on relatively constant classifications of research activities, so that maps of different time periods become comparable and changes within the structure of the field become visible.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Changes, First, Interdisciplinarity, Interdisciplinary, Research, Structure, Techniques

? Plomp, R. (1994), The highly cited papers of professors as an indicator of a research groups scientific performance. *Scientometrics*, **29** (3), 377-393.

Full Text: [1994\Scientometrics29, 377.pdf](1994/Scientometrics29,%20377.pdf)

Abstract: In the first part of the paper the citations in 1986 and 1987 of 3938 papers published in 1985 by 324 research groups in the faculties of science and of medicine of eight universities in the Netherlands are analyzed. Because of the large statistical spread of (1) the number of short-term citations of papers cited equally frequently over a long period, and (2) the number of citations over a long period of papers by the same author, short-term citation scores appear to be an unreliable indicator of a research group’s contribution to science. In the second part of the paper an alternative approach is presented, based on a subdivision of the 3938 papers in papers authored by professors with 0-2, 3-8, or greater-than-or-equal-to 9 highly cited papers (HCPs, greater-than-or-equal-to 25 citations) to their name. Very large citation score differences were found for the three categories. For example: for papers first-authored by a professor, the average number of citations per person in 1986 and 1987 for 1985 papers was for 161 professors with greater-than-or-equal-to 9 HCPs a factor 14 larger than for 575 professors with only 0-2 HCPs, for papers co-authored by professors, this factor was 6.6. These findings justify the conclusion that the number of HCPs scored by the professors (and other senior scientists) during their entire career is a much more reliable predictor of the performance of a research group than the number of short-term citations of the articles published by the group within a short period. A research group’s contribution to science is primarily determined by the individual scientific talents of its members.

Keywords: Alternative, Citation, Citations, First, Impact, Indicator, Medicine, Papers, Person, Research, Science, The Netherlands, Universities

? Glänzel, W. and Kretschmer, H. (1994), Selected papers presented at the 4th international-conference on bibliometrics, informetrics and scientometrics: In memory of Price, Derek, John, Desolla (1922-1983) September 11-15, 1993, Berlin (Germany) - Preface. *Scientometrics*, **30** (1), 5-6.

Full Text: Scientometrics30, 5.pdf

Keywords: Bibliometrics, Germany, Scientometrics

Arunachalam, S., Srinivasan, R. and Raman, V. (1994), International collaboration in science: Participation by the Asian giants. *Scientometrics*, **30** (1), 7-22.

Full Text: [1994\Scientometrics30, 7.pdf](1994/Scientometrics30,%207.pdf)

Abstract: Science in the last few years has become increasingly global and collaborative. The number of internationally coauthored papers has been increasing steadily. We have counted internationally jointly authored papers involving authors from the advanced countries and the Third World countries, using SCI 1991. We have looked at the number of papers resulting from collaboration among authors residing in the countries of the North (e.g. EC and OECD countries), authors residing in the South (e.g. India and Bangladesh, Mexico and Brazil, China and Pakistan) and papers resulting from collaboration between authors residing in the countries of the South and the North (e.g. India and UK, China and USA). Despite its late start, China has published many more collaborative papers with most Asian countries and the advanced countries of the West except the UK than India - confirming the effectiveness of the open door policy of post-Mao China. Both India and China collaborate with USA much more often in physics than in other areas, followed by clinical medicine. However, India collaborates more with USA in chemistry than China. In Indo-US and Sino-US collaborations, collaborating institutions are mostly universities and institutes of higher learning in India and USA, whereas in China several institutions under the Academies also take part. The percentage of collaborative papers involving authors from India is even smaller than the percentage of journal articles originating from India. In general, papers resulting from international collaboration appear in better journals and are cited more often than papers that are the outcome of local research.

Keywords: Bangladesh, Brazil, Chemistry, China, Clinical, Collaboration, EC, Effectiveness, India, Institutions, International, Journal, Journal Articles, Journals, Learning, Medicine, Mexico, Pakistan, Papers, Policy, Research, SCI, UK, Universities, USA

? Delooze, M.A. (1994), The application of scientometric tools to the analysis of a sector in plant biotechnologies: Nitrogen-fixation. *Scientometrics*, **30** (1), 23-34.

Full Text: [1994\Scientometrics30, 23.pdf](1994/Scientometrics30,%2023.pdf)

Abstract: The application of biliometric methods and tools for analysing data from information sciences and patent data bases allow us to obtain different representations of an area that is particularly fragmented and difficult to interpret: plant biotechnologies in which nitrogen fixation has been particularly highlighted.

Keywords: Citation, Indicators, Information, Methods, Patent, Patents, Plant, Science, Sciences, Technology

? Egghe, L. (1994), Bridging the gaps: Conceptual discussions on informetrics. *Scientometrics*, **30** (1), 35-47.

Full Text: [1994\Scientometrics30, 35.pdf](1994/Scientometrics30,%2035.pdf)

Abstract: In this paper we discuss the possible gaps between several subdisciplines in informetrics and between informetrics and other -metrics disciplines such as econometrics, sociometrics and so on. It is argued that in all these disciplines, common models exist which describe the main points of interest, We also show that many concrete problems in these disciplines can be formulated in the same way and hence have similar solutions. We can conclude with the statement that the possible gaps between these disciplines are smaller than what many researchers in these different areas may feel and hence that many research projects could be set up in a wider framework.

Keywords: Concrete, Econometrics, Framework, Informetrics, Metrics, Models, Obsolescence, Research

Glänzel, W. and Schoepflin, U. (1994), A stochastic model for the aging of scientific literature. *Scientometrics*, **30** (1), 49-64.

Full Text: [1994\Scientometrics30, 49.pdf](1994/Scientometrics30,%2049.pdf)

Abstract: A non-homogeneous birth process is used to describe the statistical properties of bibliometric citation processes. The model is analysed under special assumptions. The life-time distribution, special probabilities and mean value functions are used to characterize differences in the ageing structure of scientific literature, the change of citation impact in time and to analyse predictive aspects of reception processes. The results are applied to selected journals representing one field in science and social science each. The empirical part of the study is based on a 14-year citation history (papers published in 1978 and cited 1978-1991). An intimate connection between impact and ageing cannot be observed. However, the ageing behaviour seems to be clearly influenced by field characteristics and by special document, journal types, such as letters and short communications

Keywords: Ageing, Assumptions, Behaviour, Bibliometric, Citation, Communications, Functions, History, Journals, Literature, Model, Papers, Science, Structure

Van Hooydonk, G., Gevaert, R., Milisproost, G., Vandesompel, H. and Debackere, K. (1994), A bibliotheconomic analysis of the impact factors of scientific disciplines. *Scientometrics*, **30** (1), 65-81.

Full Text: [1994\Scientometrics30, 65.pdf](1994/Scientometrics30,%2065.pdf)

Abstract: An attempt is made to correlate bibliometric data of journals (impact factors, half-life) for scientific disciplines in the exact sciences to bibliotheconomic data (subscription prices, prices per article and holdings). Data are presented for 5399 journals in 131 disciplines, as mentioned in the Journal Citation Reports 1990 (Science Citation Index)

Keywords: Bibliometric, Bibliometrics, Impact Factors, Journal Citation Reports, Journal Costs, Journals, Science Citation Index, Sciences

? Jeannin, P. and Devillard, J. (1994), Towards a demographic approach to scientific journals. *Scientometrics*, **30** (1), 83-95.

Full Text: [1994\Scientometrics30, 83.pdf](1994/Scientometrics30,%2083.pdf)

Abstract: This paper sheds, through the concepts of demography, a different light on the study of scientific journals. Without leaving aside the major role played by scientific journals. such an approach allows for the use of tools which are at the basis of information watch in research. Different key variables are used such as the date of its birth of a journal (resp. its date of death), the migration to other fields of knowledge or to other audiences... A certain number of indicators are exposed such as the rates (gross or net) of new publications or deaths. Some applications are proposed.

Keywords: Death, Indicators, Information, Journal, Journals, Knowledge, Publications, Research, Scientific Journals

? Maciaschapula, C.A. (1994), Non-SCI subject visibility of the Latin-American scientific production in the health field. *Scientometrics*, **30** (1), 97-104.

Full Text: [1994\Scientometrics30, 97.pdf](1994/Scientometrics30,%2097.pdf)

Abstract: The purpose of this work was to analyse the non-Science Citation Index subject visibility of the Latin American production in the health field. The methodology used considered manual and automated retrieval of the Latin American journals, as covered by different conventional secondary sources. The IMLA/LILACS (Index Medicus Latinoamericano/Latin American Literature in the Health Sciences) database was used to obtain a master list of the ‘sustained’ journals for the period 1979-1990. The selected journals were classified by subject content, following the scheme of the U.S. National Library of Medicine. A total of 221 journals were selected and a database was developed. The results corroborated the leadership of Brazil in the field. It was also found that the subject content had a strong trend toward the ‘clinical’, medicine field. The subject ‘Medicine’ was head in the list, with seventy four journals. Several difficulties and barriers to the use of the IMLA/LILACS database were detected. The implications of the overall analysis of this study as affecting researchers, policy makers and data-base producers are stressed by the author.

Keywords: Analysis, Brazil, Data Base, Database, Health, Journals, Leadership, Medicine, Methodology, Policy, Work

? Makovetskaya, O. and Bernadsky, V. (1994), Scientometric indicators for identification of technology system life-cycle phase. *Scientometrics*, **30** (1), 105-116.

Full Text: [1994\Scientometrics30, 105.pdf](1994/Scientometrics30,%20105.pdf)

Abstract: This paper presents a methodology of analysis of scientometric data reflecting dynamics of technology-oriented R & D. The data base contains a range of articles, patents and standards in the field of welding technologies world-wide and covers the period from 1961 to 1989. The methodology allows to identify the current phase of a technology life cycle in a given country or company and to compare it to that of the leading countries. These data allow to make more motivated decisions in science policy and R & D management.

Keywords: Analysis, Data Base, Dynamics, Life, Management, Methodology, Patents, Policy, Science, Science Policy, Scientometric, Standards, Technologies, Technology

? Martens, B. and Saretzki, T. (1994), Quantitative-analysis of thematic structures in the field of biotechnology: A study on the basis of conference data. *Scientometrics*, **30** (1), 117-128.

Full Text: [1994\Scientometrics30, 117.pdf](1994/Scientometrics30,%20117.pdf)

Abstract: Conferences and other kinds of scientific meetings are becoming increasingly important as means of scientific communication, especially in highly dynamic and multidisciplinary fields of knowledge. A ‘conference approach’ has been pursued by collecting and analyzing data about conferences, courses, workshops, and exhibitions in the field of new biotechnology. The data cover the period of 1984-91. The textual conference data were categorized using a content analytic approach and a coding scheme. It encompasses all relevant fields of biotechnology, describing them in five dimensions: fields of knowledge, areas of application, groups of organisms that are of interest at meetings, methods of biotechnological relevance, and contexts of application and further development of biotechnology. In addition, variables describing the social, spatial. and time dimensions of scientific meetings as social gatherings were also taken into consideration. Distributions of and correlations between the categories are used to analyze structures of themes. If one differentiates these thematic structures according to organizing institutions, countries, and time. certain pecularities will be clearly visible.

Keywords: Biotechnology, Coding, Communication, Conferences, Correlations, Development, Institutions, Knowledge, Methods, Multidisciplinary, Relevance, Scientific Communication, Workshops

? Matricciani, E. (1994), Shannons entropy as a measure of the life of the literature of a discipline. *Scientometrics*, **30** (1), 129-145.

Full Text: [1994\Scientometrics30, 129.pdf](1994/Scientometrics30,%20129.pdf)

Abstract: The paper is divided in two parts. Part I deals with the novel use of the concept of entropy H (measured in nepers) of the age T of references cited in the literature of a specialty, and the derived parameter S=exp(H) (measured in years). We have proposed to use S (or H) as a measure of the obsolescence of the literature. The concept of entropy comes from the Theory of Information (Shannon) where its mathematical properties have been widely studied and are thus available. H and S have been calculated for the log-normal probability density functions (which model the empirical distributions of T) of some IEEE journals and for the 58-year collection of an electronics journal, and then they have been compared to the total utility function, this latter defined in the literature. Part II recalls and discusses the mean residual life, M(T), and the expected life E(T), of a reference of age T (concepts borrowed from lifetime data analysis). Besides their intrinsic applications. another possible application of these concepts may be in defining quantitatively the age of ‘historical’ papers. Examples taken from the literatures of the XX and XIX centuries have been reported.

Keywords: Analysis, Data Analysis, Entropy, Function, Functions, Journal, Journals, Life, Literature, Model, Obsolescence, Papers, Specialty, Utility

? Narin, F. (1994), Patent bibliometrics. *Scientometrics*, **30** (1), 147-155.

Full Text: [1994\Scientometrics30, 147.pdf](1994/Scientometrics30,%20147.pdf)

Abstract: In our 1975 monograph ‘Evaluative Bibliometrics’ we discussed the many uses of publication and citation analysis in the evaluation of scientific activities, and some of the basic statistical properties of the scientific literature, particularly the skewnness of the distributions of publications and citations, reference time distributions, and various anomalies in the citation patterns from one country to another. Over the last ten years we have devoted much of our energy to the development of an analogous research base and infrastructure for patent bibliometrics, that is for the use of patents, and patent citations in the evaluation of technological activities. There are remarkable similarities between literature bibliometrics and patent bibliometrics, and they are both applicable to the same wide ranges of problems. This paper will show that there are striking similarities between literature and patent distributions of national productivity, inventor productivity, referencing cycles, citation impact and within country citation preferences.

Keywords: Analysis, Bibliometrics, Citation, Citation Analysis, Citation Patterns, Citations, Development, Evaluation, Literature, Patent, Patent Citations, Patents, Publication, Publications, Referencing, Research

? Noyons, E.C.M. and Vanraan, A.F.J. (1994), Bibliometric cartography of scientific and technological developments of an research-and-development field: The case of optomechatronics. *Scientometrics*, **30** (1), 157-173.

Full Text: [1994\Scientometrics30, 157.pdf](1994/Scientometrics30,%20157.pdf)

Abstract: This paper presents the results of an exploration of bibliometric mapping as an analytic tool to study the important aspects of the relation between science and technology, in particular the ‘science base’ of technology. We discuss a bibliometric (in particular a publication- and patent-based) approach to develop a cartography of science and technology, i.e., the construction of geometrically organized maps in order to visualize the changing internal structure of science and technology. These maps are based on co-occurrences of publication and patent keywords. We focus on a specific R & D field: optomechatronics. This field is characterized by a strong knowledge transfer between science and technology. We constructed maps for both the science as well as the technology ‘side’. Comparison of these two allows the exploration of existing or possible interaction of scientific and technological developments. We identified related subfields (co-word clusters) in the maps of both ‘sides’ in order to illustrate the interaction between science and technology. Subsequently, we extended the information given by the maps with information on the role and position of a number of countries in the different subfields of optomechatronics, both at the science side as well as at the technology side. This is done by identification of actors in the subfields represented by word clusters in the maps. Cartography of science and technology allows the observation of the structure (and its changes) of scientific and technology fields. Moreover, it illustrates both existing as well as possible links between science and technology. It therefore presents a powerful tool for science, technology and R & D policy.

Keywords: Bibliometric, Bibliometric Mapping, Changes, Identification, Information, Interaction, Knowledge, Patent, Policy, Publication, Science, Science And Technology, Structure, Technology

? Peritz, B.C. (1994), On the heuristic value of scientific publications and their design: A Citation Analysis of Some Clinical-Trials. *Scientometrics*, **30** (1), 175-186.

Full Text: [1994\Scientometrics30, 175.pdf](1994/Scientometrics30,%20175.pdf)

Abstract: The assumption underlying citation analysis is that the citing authors select their references in a rational manner. The present study, based on a very homogeneous collection of clinical trials from a meta-analysis, provides a partial verification of this idea: citing authors prefer large studies to smaller ones, they also seem to prefer studies representing the minority view of the research issue, perhaps in order to make their presentation more balanced. On the other hand, in this instance the inclusion of a placebo in the study design does not affect citation frequency. Furthermore, the conjecture that heuristic value is a main determinant of citability is not settled.

Keywords: Analysis, Citation, Citation Analysis, Citation Frequency, Clinical, Clinical Trials, Meta-Analysis, Placebo, Research, Study Design

? Rikken, F. and Vos, R. (1994), Searching for adverse drug-reactions at the margin of scientific fields: The scientometric detection of peripheral but potentially innovative developments in pharmaceutical research. *Scientometrics*, **30** (1), 187-199.

Full Text: [1994\Scientometrics30, 187.pdf](1994/Scientometrics30,%20187.pdf)

Abstract: Results are presented of a scientometric analysis focusing on peripheral dynamics in a scientific field. We evaluate different techniques on their appropriateness for detecting relations between aspects that seem to be not of central interest but are important in innovative research. We do so in order to quantify the role that adverse drug reactions can play as trigger points in innovative drug research.

Keywords: Adverse Drug Reactions, Analysis, Drug, Dynamics, Maps, Relations, Research, Science, Scientometric, Techniques

? Roman, A. and Mendez, A. (1994), The Spanish transition to democracy seen through the Spanish database ISOC. *Scientometrics*, **30** (1), 201-212.

Full Text: [1994\Scientometrics30, 201.pdf](1994/Scientometrics30,%20201.pdf)

Abstract: The study has tried to look at the political transition through the articles publisbed by Spanish scientists in Spanish journals of Social Sciences and Humanities. A sample of 11000 article references from a selected set of 32 journals published from 1976 till 1985, has been the basis of the analysis. This time frame has been divided into two 5 year periods in order to detect any change in the topics published. The result of the analysis has been compared with the ‘events’ as recorded by ‘El Pais’ a very popular newspaper, during the same 10 year period and with a set of specific articles devoted to the Spanish political transition.

Keywords: Analysis, Journals

? Rousseau, R. (1994), Double exponential models for 1st-citation processes. *Scientometrics*, **30** (1), 213-227.

Full Text: [1994\Scientometrics30, 213.pdf](1994/Scientometrics30,%20213.pdf)

Abstract: The purpose of this article is to find a model for the first-citation or response distribution. Starting from plausible assumptions, we derive differential equations, whose solutions yield the requested functions. In fact, we propose two different double exponential distributions as candidates to describe the first-citation process. We found that some real data are best fitted by the first of these models and other by the second. We further note that Gompertz’ curve plays an important role in this second model. These models can be used to predict the total number of articles in a fixed group that will ever be cited. We conclude that further research is needed to find out when one of the two models is more appropriate than the other.

Keywords: Assumptions, Citation, First, Functions, Model, Models, Research

? Small, H. (1994), A SCI-map case-study: Building a map of aids research. *Scientometrics*, **30** (1), 229-241.

Full Text: [1994\Scientometrics30, 229.pdf](1994/Scientometrics30,%20229.pdf)

Abstract: SCI-Map is a new PC based system for mapping the scientific literature. By selecting a seed item, the user can build a network or cluster of nodes interactively, and can view the structure as it is being built. New nodes are selected for addition to the network by the strength of their links to the items already clustered, and the positions of new nodes are determined by a geometric triangulation method. SCI-Map can be used to perform cluster-based retrieval using co-citation or other measures of document association, and enables the user to explore the structure of large document sets. This case study focuses on the AIDS literature and shows how the network is built up topic by topic, the recall of the final cluster, and where AIDS connects to the literature of other fields.

Keywords: Aid, AIDS, Association, Case Study, Co-Citation, Cocitation, Literature, Network, Structure

? Soderqvist, T. and Silverstein, A.M. (1994), Studying leadership and subdisciplinary structure of scientific disciplines: Cluster-analysis of participation in scientific meetings. *Scientometrics*, **30** (1), 243-258.

Full Text: [1994\Scientometrics30, 243.pdf](1994/Scientometrics30,%20243.pdf)

Abstract: A new method for the analysis of leadership and subdisciplinary structure of a scientific discipline is discussed. The database consists of lists of participants in international scientific meetings. Disciplinary leaders are identified by means of their frequency of participation. The subdisciplinary structure is mapped by means of cluster analysis of meetings with respect to degree of similarity. The method possesses strengths not shared by citation analysis: in addition to scientists frequently cited in the literature for their contribution to cognitive research programs, it also identifies administrative discipline builders. The method may also represent better the cognitive interests of scientists.

Keywords: Analysis, Citation, Citation Analysis, Cluster Analysis, Database, International, Leadership, Literature, Research, Similarity, Structure

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Full Text: [1994\Scientometrics30, 259.pdf](1994/Scientometrics30,%20259.pdf)

Abstract: The value or informativeness of an item in a library collection or database has been measured by its frequency of circulation or access. This paper presents a more discriminating measure, user contact time, and develops a model for its distribution over users and over time. The model is applied to the problem of predicting future informativeness of an item.

Keywords: Access, Database, Library, Model, Modeling

? Turner, W.A., Lelu, A. and Georgel, A. (1994), Geode: Optimizing data-flow representation techniques in a network information-system. *Scientometrics*, **30** (1), 269-281.

Full Text: [1994\Scientometrics30, 269.pdf](1994/Scientometrics30,%20269.pdf)

Abstract: The Informetrics Research Group (CERESI/CNRS) was recently created by the Mission for Scientific and Technical Information and Communication of the CNRS. CERESI’s goal is to study the impact of computer supported information exchanges on the social processes underlying the construction of scientific knowledge. A better understanding of this impact should help in designing and building scientific and technical information management systems. In this paper, we will focus on one aspect of our work: mapping science and technology in order to build dynamic representations of science and technology.

Keywords: Information, Knowledge, Management, Science, Science and Technology, Technology, Understanding, Work

? Vinkler, P. (1994), The origin and features of information referenced in pharmaceutical patents. *Scientometrics*, **30** (1), 283-302.

Full Text: [1994\Scientometrics30, 283.pdf](1994/Scientometrics30,%20283.pdf)

Abstract: 50 pharmaceutical patents granted to firms, residing in US, CIB, DE and HU each, were surveyed and the average numbers of scientific as well as patent items referenced by the inventors were calculated. The sum of impact factors of the journals referenced (Total Weighted Impact) was calculated by scientific fields. About 50-60 per cent of scientific information referred to in the patents was found to originate from Life Sciences journals. It was found that 10 per cent of the journals referenced contained 55 per cent of the papers.

Keywords: Impact Factors, Indicators, Information, Journals, Linkage, Papers, Patent, Patents, Science, Scientific Information, Technology, US

? Wagnerdobler, R. and Berg, J. (1994), Regularity and irregularity in the development of scientific disciplines: The case of mathematical logic. *Scientometrics*, **30** (1), 303-319.

Full Text: [1994\Scientometrics30, 303.pdf](1994/Scientometrics30,%20303.pdf)

Abstract: We report on results from an analysis of mathematical logic from 1874 to the present time, covering about 15,000 authors with 50,000 publications. Frequency distributions in terms of contributions or in terms of the number of special areas dealt with exhibited a well-known lognormal form. A dynamic version of Price’s inverse square (or power) law of elitism seems to be corroborated. The idea of a general exponential growth law is not convincing, however. All forms of growth of logic areas occur. In this contribution we apply, in addition, Goffman’s epidemic model, contained in one of the rare theories of scientific dynamics, to the development of logic and formulate ex-post-ante prognoses of some areas of logic. The outcome casts doubts on the applicability in scientometrics of the epidemic theory in the form suggested by Goffman.

Keywords: Analysis, Chaos, Development, Dynamics, Epidemic, Growth, Informetric Distributions, Law, Model, Publications, Scientometrics, Theory

? Yitzhaki, M. (1994), Relation of title length of journal articles to number of authors. *Scientometrics*, **30** (1), 321-332.

Full Text: [1994\Scientometrics30, 321.pdf](1994/Scientometrics30,%20321.pdf)

Abstract: The great importance of titles being highly informative is almost unanimously accepted in literature, assuming that the more informative titles are, the more effectively they serve their functions. The most common measure of title ‘informativeness’ has been the number of ‘substantive’ words included in it, and one of the factors which might be associated with it is the number of authors. The present study attempted to test, in a large group of journals from different areas, and over six decades, the hypothesis that a paper signed by a larger number of authors will have more substantive words in its title. Large samples of original research papers were drawn from each decade year of fourteen leading journals. For each paper, the number of substantive words in the title was correlated with the number of authors. Findings indicate a difference between the scientific journals on the one hand, and the social sciences and humanities journals on the other. A moderate positive correlation was found in most scientific journals (excluding mathematics) for many periods. In the social sciences journals, and to a greater extent, in the humanities journals, a significant positive correlation was limited to only a few periods, while the rest showed a very low correlation, or even a negative correlation. The different findings for the sciences may be somehow associated with their higher rate of multiple authorship.

Keywords: Authorship, Functions, Humanities, Journals, Literature, Papers, Research, Sciences, Scientific Journals, Social Sciences

Zitt, M. and Bassecoulard, E. (1994), Development of a method for detection and trend analysis of research fronts built by lexical or cocitation analysis. *Scientometrics*, **30** (1), 333-351.

Full Text: [1994\Scientometrics30, 333.pdf](1994/Scientometrics30,%20333.pdf)

Abstract: Detecting homogeneous areas in research networks is a very common feature of bibliometric analysis, either for academic or policy purposes. The method presented here combines structural analysis and trend detection, by operating on a ‘thick-slice’ of time, starting from co-citation or co-word analysis (applications of either type have already been carried on). Significance of ‘trend’ of clusters is partially addressed, through an analysis of publication delays. Examples are given on a co-citation analysis in the field of astrophysics (1986-1989).

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Co-Citation, Co-Citation Analysis, Cocitation, Feature, Policy, Publication, Research, Science, Word Analysis

Bookstein, A. (1994), Towards a multi-disciplinary Bradford law. *Scientometrics*, **30** (1), 353-361.

Full Text: [1994\Scientometrics30, 353.pdf](1994/Scientometrics30,%20353.pdf)

Abstract: Bradford’s law, perhaps the most well known of the Informetric regularities, analyzes the scattering of articles in a single discipline over journals. Yet journals are multi-disciplinary entities. This paper discusses the implications for Bradford’s law of the multi-disciplinary character of journals, and defines a simple model that indicates the evolution of journals as a competition among subjects for space.

Keywords: Competition, Evolution, Informetric Distributions, Journals, Law, Model, Multidisciplinary, Scattering

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Full Text: [1994\Scientometrics30, 363.pdf](1994/Scientometrics30,%20363.pdf)

Abstract: In invisible colleges the relative frequency of coauthorships is higher between scientists with the same number of publications than between authors of different ones. The opposite is valid in institutionalized communities.

Keywords: Publications

? Braun, T. (1994), Foreword. *Scientometrics*, **30** (2-3), 373.

Full Text: [1994\Scientometrics30, 373.pdf](1994/Scientometrics30,%20373.pdf)

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Full Text: [1994\Scientometrics30, 375.pdf](1994/Scientometrics30,%20375.pdf)

Abstract: Although the field of scientometries/bibliometries is rapidly growing, and the interest in scientometric indicators is constantly rising, the field is in a crisis: subfields are drifting apart, the field is lacking consensus in basic questions and of internal communication, the quality of scientometric research is questioned by other disciplines. Among the causes stated are: the loss of integrating personalities, shift from basic and methodological research to applied bibliometrics, domination of the interests of science policy and business in commissioning and funding research, vendor policies and failing quality-management on the side of database-producers, misuse of bibliometric research results and disregard for scientific standards. To overcome the situation, the authors plead for integrative and interdisciplinary research approaches, for reinforcing fundamental, methodological and experimental research programs in scientometrics, for independent funding of research, and for an enhancement of scientometric databases. The need for acknowledged technical and scientific standards in research and publication is stressed. Finally, the establishment of a Code of Ethics for the field of scientometrics is proposed.

Keywords: Bibliometric, Bibliometric Research, Bibliometrics, Business, Communication, Consensus, Experimental, Indicators, Integrative, Interdisciplinary, Policy, Publication, Quality, Quality Management, Research, Science, Science Policy, Scientometric, Scientometrics, Standards

? Rousseau, R. (1994), Similarities between informetrics and econometrics. *Scientometrics*, **30** (2-3), 385-387.

Full Text: [1994\Scientometrics30, 385.pdf](1994/Scientometrics30,%20385.pdf)

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Full Text: Scientometrics30, 389.pdf

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Full Text: [1994\Scientometrics30, 393.pdf](1994/Scientometrics30,%20393.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 397.pdf](1994/Scientometrics30,%20397.pdf)

Keywords: Scientometrics

? Dou, H. (1994), In which business are we. *Scientometrics*, **30** (2-3), 401-406.

Full Text: [1994\Scientometrics30, 401.pdf](1994/Scientometrics30,%20401.pdf)

Abstract: I read the article of Glänzel and Schoepflin: Little Scientometrics, Big Scientometrics ... and Beyond. This paper presents scientometrics in a very pessimistic way, but, in my opinion it rises the following question: in which business are we? Are we in the analysis of the science production? Do we develop new tools to analyse the textual information? And, above all we use our results and for which purposes. It seems to me that if we answer those questions, a large step will be made in the understanding of the whereabout of our business.

Keywords: Analysis, Business, Information, Science, Scientometrics, Understanding

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Full Text: [1994\Scientometrics30, 407.pdf](1994/Scientometrics30,%20407.pdf)

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Full Text: [1994\Scientometrics30, 411.pdf](1994/Scientometrics30,%20411.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 415.pdf](1994/Scientometrics30,%20415.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 419.pdf](1994/Scientometrics30,%20419.pdf)

Keywords: Bibliometrics

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Full Text: [1994\Scientometrics30, 425.pdf](1994/Scientometrics30,%20425.pdf)

Keywords: Indicators, Scientometrics

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Full Text: [1994\Scientometrics30, 429.pdf](1994/Scientometrics30,%20429.pdf)

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Full Text: [1994\Scientometrics30, 433.pdf](1994/Scientometrics30,%20433.pdf)

Keywords: Indicators, Science

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Full Text: [1994\Scientometrics30, 439.pdf](1994/Scientometrics30,%20439.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 443.pdf](1994/Scientometrics30,%20443.pdf)

Keywords: Scientometrics

Meadows, A.J. (1994), Little scientometrics, big scientometrics ... and beyond. *Scientometrics*, **30** (2-3), 447-449.

Full Text: [1994\Scientometrics30, 447.pdf](1994/Scientometrics30,%20447.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 451.pdf](1994/Scientometrics30,%20451.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 455.pdf](1994/Scientometrics30,%20455.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 461.pdf](1994/Scientometrics30,%20461.pdf)

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Full Text: [1994\Scientometrics30, 465.pdf](1994/Scientometrics30,%20465.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 471.pdf](1994/Scientometrics30,%20471.pdf)

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Full Text: [1994\Scientometrics30, 481.pdf](1994/Scientometrics30,%20481.pdf)

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Full Text: [1994\Scientometrics30, 487.pdf](1994/Scientometrics30,%20487.pdf)

Keywords: Scientific Literatures, Scientometrics

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Full Text: [1994\Scientometrics30, 495.pdf](1994/Scientometrics30,%20495.pdf)

Keywords: Science, Scientometrics

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Full Text: [1994\Scientometrics30, 505.pdf](1994/Scientometrics30,%20505.pdf)

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Full Text: [1994\Scientometrics30, 511.pdf](1994/Scientometrics30,%20511.pdf)

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Full Text: [1994\Scientometrics30, 517.pdf](1994/Scientometrics30,%20517.pdf)

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Full Text: [1994\Scientometrics30, 521.pdf](1994/Scientometrics30,%20521.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 529.pdf](1994/Scientometrics30,%20529.pdf)

Keywords: Scientometrics

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Full Text: [1994\Scientometrics30, 533.pdf](1994/Scientometrics30,%20533.pdf)

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Full Text: [1994\Scientometrics30, 539.pdf](1994/Scientometrics30,%20539.pdf)

Keywords: Leximappe, Network, Scientometrics

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Full Text: [1994\Scientometrics31, 3.pdf](1994/Scientometrics31,%203.pdf)

Keywords: Countries, Datafiles, Facts, Figures, Indicators, Newest Version, Physics

? Katz, J.S. (1994), Geographical proximity and scientific collaboration. *Scientometrics*, **31** (1), 31-43.

Full Text: [1994\Scientometrics31, 31.pdf](1994/Scientometrics31,%2031.pdf)

Abstract: Geography, economic, socio-political and language are considered to be factors that effect the level of research collaboration. However, to-date no technique has been developed to isolate the effect of geographical proximity from the other factors. This paper presents a methodology for specifically examining geographical effects on intra-national scientific collaboration. An investigation of intra-national university-university collaboration in Canada, Australia and the United Kingdom using this technique demonstrates that research cooperation decreases exponentially with the distance separating the collaborative partners.

Keywords: Australia, Canada, Collaboration, Cooperation, Investigation, Methodology, Research, Research Collaboration, Scientific Collaboration, United Kingdom

? Milman, B.L. (1994), Individual cocitation clusters as nuclei of complete and dynamic informetric models of scientific and technological areas. *Scientometrics*, **31** (1), 45-57.

Full Text: [1994\Scientometrics31, 45.pdf](1994/Scientometrics31,%2045.pdf)

Abstract: This paper describes the construction of improved informetric models of individual scientific and technological areas on the basis of individual co-citation clusters. The developed methodology of replenishment of research front with accidentally absent papers describes more completely the model. The simple method of cluster ‘dynamisation’ is proposed for the study of evolution of a research area. The transition under consideration from co-citation clusters to lexical maps of papers and patents allows to monitor the relationship between R and D in a given technological area. Pressure-swing adsorption (PSA) as modern chemical engineering, is given as an example.

Keywords: Adsorption, Co-Citation, Cocitation, Collagen Research, Combined Cocitation, Evolution, Methodology, Model, Models, Papers, Patents, Research, Research Front, Science, Tool, Word Analysis

Leydesdorff, L. (1994), The generation of aggregated journal-journal citation maps on the basis of the CD-ROM version of the Science Citation Index. *Scientometrics*, **31** (1), 59-84.

Full Text: [1994\Scientometrics31, 59.pdf](1994/Scientometrics31,%2059.pdf)

Abstract: A method is described for the generation of journal-journal citation maps on the basis of the CD-ROM version of the Science Citation Index. Various sources of potential errors in using this data are discussed, and strategies are suggested to counteract these errors. A number of scientometric journal mappings are analyzed in relation to mappings from previous studies which have used tape data and/or data from ISI’s Journal Citation Reports. The quality of these mappings is compared with the quality of those for previous years in order to demonstrate usefulness of such mappings as indicators for dynamic developments in the sciences.

Keywords: Citation, Generation, Indicators, Journal, Journal Citation Reports, Potential, Quality, Science Citation Index, Sciences, Scientometric

? Saurer, W. and Weinberger, R. (1994), Planetary-nebulae: Some statistics on a continuously growing field and its contributors. *Scientometrics*, **31** (1), 85-95.

Full Text: [1994\Scientometrics31, 85.pdf](1994/Scientometrics31,%2085.pdf)

Abstract: By use of the subject category ‘Planetary Nebulae’ (PNe) in the semiannual volumes of Astronomy and Astrophysics Abstracts for the years 1986 to 1990, we statistically investigated items like the number of individuals with at least one paper concerning PNe (e.g. 331 in 1990), how this number is distributed among the 31 countries involved in PNe research (with the former USSR counted as one country), how the USA, Europe, and the remaining countries share the total number over 5 years (333, 317, and 283, respectively), etc. Furthermore, we give the number of publications, per individual and per year, in each country (The Netherlands is leading). We learned, that on the average there are 2.47 authors per PNe paper, and that the PNe researchers are producing 1.74 papers per year - if they publish at least once per year on PNe. In addition, we do not hesitate to give a list of names (the Top Ten), as far as their total number of papers on PNe are concerned. Last not least - do you have a guess how many individuals published at least one paper on PNe within these five years? There are 933.

Keywords: Astronomers, Europe, Papers, Publications, Research, Trends, USA

? Nagpaul, P.S. and Sharma, L. (1994), Research output and transnational cooperation in physics subfields: A multidimensional-analysis. *Scientometrics*, **31** (1), 97-122.

Full Text: [1994\Scientometrics31, 97.pdf](1994/Scientometrics31,%2097.pdf)

Abstract: This paper compares the profiles of research output and transnational cooperation (as revealed through multicountry publications) of thirty six countries in ten subfields of Physics during the period 1981-1985. The data for comparative analysis were taken from Braun et al.1 Since raw counts of publications are confounded by the size of the countries and the size of the research fields, this comparison is made, using relative indicators - activity index and collaboration index. The structures of research output and transnational cooperation are analyzed through Correspondence Analysis, which leads to the identification of countries with similar profiles (of research output and transnational cooperation) and the spatial representation of countries and Physics subfields. The configurations of research output and transnational cooperation are compared to assess the concordance between the policies of these countries for research and transnational cooperation in Physics.

Keywords: Analysis, Citation, Collaboration, Comparison, Cooperation, Identification, Indicators, Patterns, Publications, Representation, Research, Size

? Bonitz, M. (1994), Untitled. *Scientometrics*, **31** (1), 123.

Full Text: [1994\Scientometrics31, 123.pdf](1994/Scientometrics31,%20123.pdf)

Lewison, G. (1994), Publications from the European Community’s Biotechnology Action Program (BAP): Multinationality, acknowledgment of support, and citations. *Scientometrics*, **31** (2), 125-142.

Full Text: [1994\Scientometrics31, 125.pdf](1994/Scientometrics31,%20125.pdf)

Abstract: Results are presented of an analysis of 1333 papers in the SCI from 1986-1993 supported by the BAP, with their degree of tans- nationality, level of dependence on the programme and propensity to acknowledge this, and their record of citation by authors in different groups of countries. The papers are nearly three times as transnational in their addresses as other EC biotechnology papers, but nearly 25% of single country papers depend on foreign co-authors or acknowledge transnational support. BAP was acknowledged by 80% of the papers that received 20% or more support. Citations by authors from other EC Member States account for many of the extra citations received by BAP papers and show that the results of the programme have been effectively disseminated by the Commission within the EC.

Keywords: Analysis, Biotechnology, Citation, Citations, Co-Authors, EC, International Scientific Collaboration, Papers, Patterns, Record, SCI

Notes: MModel

Kyvik, S. (1994), Popular science publishing. *Scientometrics*, **31** (2), 143-153.

Full Text: [1994\Scientometrics31, 143.pdf](1994/Scientometrics31,%20143.pdf)

Abstract: The article gives an overview of the extent of popular science publishing and contributions to public debate, as compared to scientific publishing among faculty members at Norwegian universities. Faculty publish far fewer articles for the lay public than publications for their specialist colleagues. There are, however, clear field differences in this respect. The most productive researchers in terms of scientific publishing are also the most prolific in non-scientific publishing.

Keywords: Faculty, Lotka Law, Publications, Publishing, Science, Universities

? Vanderkruit, P.C. (1994), A comparison of astronomy in 15 member countries of the organization for economic cooperation and development. *Scientometrics*, **31** (2), 155-172.

Full Text: [1994\Scientometrics31, 155.pdf](1994/Scientometrics31,%20155.pdf)

Abstract: Various data are collected for 15 member countries of the Organisation for Economic Cooperation and Development (OECD) that have to do with the practising of astronomy: (1) using the report of the Astronomy expert meeting of the Megascience Forum of the OECD, the level of astronomy funding, size of the research communities, relative commitment to ground-based versus space-based astronomy, etc., (2) from other sources the size of the population, Gross National Product and size of the total research community, (3) from the paper of Schubert et al. (1989) data on publication and citation scores of these countries in astronomy and the total research effort (excluding social and economic sciences). Using these data the 15 countries have been ranked on: (1) the relative level of astronomy funding, (2) the relative level of performance in astronomy, (3) the correspondence between funding and performance in astronomy, (4) the relative level of performance of the total science effort, and (5) the performance in astronomy relative to that in all sciences. The results of this study have been summarized in table 10 below. Other interesting results that can be inferred from the data collected in this paper are: (1) one out of every 75,000 inhabitants of these OECD countries is an astronomical researcher, (2) each citizen of these countries spends on average 2.5 $ per year on astronomical research (either from the ground or in space), (3) the average budget per researcher amounts to roughly 200,000 $ per annum, (4) the average budget for astronomy amounts to 0.016% of the Gross National Product and of order 1% of the total budget for civilian R & D, (5) an astronomical researcher from these countries produces on average 1.7 papers each year and these papers receive on average ten citations in the first five years, (6) researchers in science (excluding economic and social sciences) make up 0.08% of the population in these countries and one in about 65 of these researchers works in astronomy or astrophysics, (7) most countries spend about one-third of their astronomy budget on salaries, one-sixth on basic support and half on observing facilities (in a ratio one to two for ground-based versus space).

Keywords: Budget, Citation, Citations, Commitment, Community, Facilities, First, Papers, Population, Publication, Research, Science, Sciences, Size, Social Sciences

? Courtial, J.P., Cahlik, T. and Callon, M. (1994), A model for social-interaction between cognition and action through a key-word simulation of knowledge growth. *Scientometrics*, **31** (2), 173-192.

Full Text: [1994\Scientometrics31, 173.pdf](1994/Scientometrics31,%20173.pdf)

Abstract: The question of knowledge construction can be regarded as a question of cognition in relation to action. Callon and al. have suggested interactive processes mixing both cognitive and social aspects of knowledge or technology. Both actors and interactions can usually be described by texts, and namely, by words. Thus knowledge development can be described through key-words network development. The authors have made simulations for knowledge development according to a local positive feed-back rule within small sets of word associations. In comparison with real data, the simulation results are fairly good. This approach leads to a general and very simple interaction model describing knowledge development. In this model, as opposed to usual cybernetics, actors constantly change, building a common scenario in relation to a mutual definition rule.

Keywords: Cognition, Comparison, Development, Interaction, Knowledge, Model, Network, Simulation, Small, Technology

Notes: MModel

Wouters, P. and Leydesdorff, L. (1994), Has price dream come true: Is scientometrics a hard science? *Scientometrics*, **31** (2), 193-222.

Full Text: [1994\Scientometrics31, 193.pdf](1994/Scientometrics31,%20193.pdf)

Abstract: At the occasion of the completion of the 25th volume of Scientometrices, we present a combined bibliometric and social network analysis of this journal. In more than one respect, Scientometrics displays the characteristics of a social science journal. Its Price Index amounts to 43.0 percent, and is remarkably stable over time. The majority of the published items in Scientometrics has been written by a single author. Moreover, the network of co-authorships is highly fragmented: most authors cooperate with no more than one or two colleagues. Both the citation networks of the authors and the network of title words indicate that the field is nonetheless highly cohesive. In this sense, a specific identity seems to have developed, indeed. Some indications concerning the character of this identity are discussed

Keywords: Analysis, Bibliometric, Citation, Citation Analysis, Indications, Journal, Network, Network Analysis, Patterns, Science, Scientometrics, Social Network Analysis

? Vinkler, P. (1994), Model of manifested communication through publications. *Scientometrics*, **31** (3), 223-239.

Full Text: [1994\Scientometrics31, 223.pdf](1994/Scientometrics31,%20223.pdf)

Abstract: Communication is essential in scientific research. Scientific papers represent the main information sources in natural sciences. A model of the Manifested Communication through Publications is introduced which makes it possible to calculate indicators characteristic of bilateral information processes. Bilateral Coupling is for example the total number of non-zero cross elements in the information matrix containing references to each other’s papers of the two teams.

Keywords: Citation, Indicators, Information, Journals, Model, Papers, Representations, Research, Science Maps, Sciences, Scientific Research

? Haiqi, Z. (1994), A bibliometric study on Medicine Chinese Traditional in MEDLINE database. *Scientometrics*, **31** (3), 241-250.

Full Text: [1994\Scientometrics31, 241.pdf](1994/Scientometrics31,%20241.pdf)

Abstract: This bibliometric analysis was examined by the references of the articles on Medicine Chinese Traditional (MCT) searched by the CD-ROM MEDLINE. The 3006 references of the articles on Mc’r which were published between 1974 and 1992 in 343 periodicals were the samples for present study. The results were illustrated in order to identify reasonably a hierarchical ranking of periodicals and to evaluate objectively a distribution of countries where those articles were published and languages in which those articles were written.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Chinese, Languages, Periodicals, Ranking

? Courtial, J.P. (1994), A coword analysis of scientometrics. *Scientometrics*, **31** (3), 251-260.

Full Text: [1994\Scientometrics31, 251.pdf](1994/Scientometrics31,%20251.pdf)

Abstract: In this paper, we will study the field through the problematic network built by scientific articles, using actor-network theory (and consequently coword analysis) as a model for scientific knowledge (regarded as a social process) growth. Scientometrics is an hybrid field made of invisible college and a lot of users, thus controlled by both scientific research and final uses. Coword analysis gives the same weight to all articles, cited or not, and consequently computes the interaction network within all kind of authors. According to already described network properties of scientific interaction, coword analysis describes the dynamic of the field in accordance with what has been observed, and suggest forecast for the future.

Keywords: Analysis, College, Growth, Interaction, Knowledge, Model, Network, Research, Scientific Research, Scientometrics, Theory

? Leclerc, M. and Gagne, J. (1994), International scientific cooperation: The continentalization of science. *Scientometrics*, **31** (3), 261-292.

Full Text: [1994\Scientometrics31, 261.pdf](1994/Scientometrics31,%20261.pdf)

Abstract: By transforming science into a vast single market for the exchange of research products, the globalization of scientific activity effects the mechanisms by which countries enter into mutual relations. It is no longer sufficient to conduct research jointly, research must also, and perhaps above all, be conducted within the strategic space of the network. In practice, the network takes the form of a cluster of nations and emerges in response to various determining factors or constraints. This does not, however, result in arbitrary criteria of association with the network: the distance from one country or group of countries able to play a regional or continental ‘governance’ role, cultural or linguistic affinities, geographic proximity, the recognition of common interests, the existence of political agreements on cooperation are all grounds for linkage or association. In short, the geography of exchanges is changing before our eyes. This study describes as ‘world-science’ marked by the collectivization of the centre, ‘centrality’ being defined not by a national monopoly, but by the ‘hard core’ of a transnational network, stratified on a continental or subcontinental basis.

Keywords: Association, Collaboration, Community, Cooperation, Criteria, Cultural, Globalization, Linkage, Market, Nations, Network, Practice, Relations, Research, Science

? Prpic, K. (1994), The sociocognitive frameworks of scientific productivity. *Scientometrics*, **31** (3), 293-311.

Full Text: [1994\Scientometrics31, 293.pdf](1994/Scientometrics31,%20293.pdf)

Abstract: Empirical research carried out on a representative sample of 921 scientists from Croatia has shown that scientific fields are important socio-cognitive productivity framework. First, this can be seen in significantly different patterns of the average scientific productivity of researchers in different fields. Second, significant are the differences in the social organization of scientific fields, especially in the fragmentation and organization of the research process, which manifest themselves with a different engagement intensity of the respondents in each stage of the project. Finally, scientific productivity predictors are structured, ranging from significant ones in some fields, to those significant everywhere (qualifications and project roles).

Keywords: Advantage, Croatia, Fields, Framework, Inequality, Performance, Research, Science

Exner, O. and Kunz, M. (1995), Citation histories of related papers in the field of chemical correlation analysis. *Scientometrics*, **32** (1), 3-10.

Full Text: [1995\Scientometrics32, 3.pdf](1995/Scientometrics32,%203.pdf)

Abstract: Four cases of citation histories of highly cited related papers from the field of chemical correlation analysis indicate that authors have been citing preferably fashionable, but less relevant references.

Keywords: Analysis, Citation, Papers

Notes: UUniversity

Nagpaul, P.S. (1995), Contribution of Indian universities to the mainstream scientific literature: A bibliometric assessment. *Scientometrics*, **32** (1), 11-36.

Full Text: [1995\Scientometrics32, 11.pdf](1995/Scientometrics32,%2011.pdf)

Abstract: This paper examines the contribution of Indian universities to the mainstream scientific literature during 1987-1989 along two distinct, but inter-related dimensions of quantity and quality of research output. The quantity of output is assessed through the number of articles published in journals covered by Science Citation Index, while the quality of output is assessed through the impact factors of journals in which the articles are published. The impact factors are normalized to eliminate the confounding effects of their covariates, viz. the subject field and the nature of journal. A number of relative indicators are constructed for inter-field and inter-institution comparisons, viz. publication effectiveness index, 1 relative quality index, 2 activity index3 and citability index.4 Inter-field comparisons are made at the level of eight macrofields: Mathematics, Physics, Chemistry, Biology, Earth & Space Sciences, Agriculture, Medical Sciences and Engineering & Technology. Inter-institution comparisons cover thirty three institutions which had published at least 150 articles in three years. The structure of correlations of these institutions with eight macrofields is analyzed through correspondence analysis of the matrices of activity and citability profiles. Correspondence analysis yields a mapping of institutions which reveals the structure of science as determined by the cumulative effect of resource allocation decisions taken in the past for different fields and institutions i.e. the effect of national science policy

Keywords: Analysis, Correlations, Correspondence Analysis, Effectiveness, Impact, Impact Factors, Indicators, Institutions, Journal, Journals, Literature, Output, Policy, Publication, Quality, Research, Science, Science Citation Index, Science Policy, Structure, Universities

? Nederhof, A.J. and Meijer, R.F. (1995), Development of bibliometric indicators for utility of research to users in society: Measurement of external knowledge transfer via publications in trade journals. *Scientometrics*, **32** (1), 37-48.

Full Text: [1995\Scientometrics32, 37.pdf](1995/Scientometrics32,%2037.pdf)

Abstract: The development of a set of bibliometric tools to contribute to the assessment and monitoring of utility of university and non-university research institutes to society is described. Trade publications were weighted according to the utility of the journals for relevant nonscientific user groups. Furthermore, one indicator addresses the extent to which a general or a specific type of audience is addressed. Results are shown for one university and one university department. In general, validation interviews show that the indicator provide a good first estimation of the potential effectivity of the knowledge transfer efforts by means of publications in trade journals to practice and policy bodies.

Keywords: Assessment, Bibliometric, Bodies, Development, First, Indicator, Interviews, Journals, Knowledge, Policy, Potential, Practice, Publications, Research, Society, University, Utility, Validation

Notes: UUniversity

Colman, A.M., Dhillon, D. and Coulthard, B. (1995), A bibliometric evaluation of the research performance of British university politics departments: Publications in leading journals. *Scientometrics*, **32** (1), 49-66.

Full Text: [1995\Scientometrics32, 49.pdf](1995/Scientometrics32,%2049.pdf)

Abstract: The research performance of 41 British university politics departments was evaluated through an analysis of articles published between 1987 and 1992 in nine European politics journals with the highest citation impact factors. Annual performance scores were obtained by dividing each department’s number of publications in these journals in each year (departmental productivity) by the corresponding departmental size. These scores were summed to obtain a research performance score for each department over the period of assessment. They correlate significantly with research performance scores from two previous studies using different methodologies: Crewe’s per capita simple publication count for the years 1978 to 1984, and the Universities Funding Council’s research selectivity ratings covering the years 1989 to 1992.

Keywords: American-Psychological-Association, Analysis, Assessment, Citation, Counts, Eminence, Impact Factors, Indicators, Journals, Politics, Publication, Publications, Ratings, Research, Research Performance, Research Productivity, Science Departments, Size, University

? Dizon, L.B. and Sadorra, M.S.M. (1995), Patterns of publication by the staff of an international fisheries research-center. *Scientometrics*, **32** (1), 67-75.

Full Text: [1995\Scientometrics32, 67.pdf](1995/Scientometrics32,%2067.pdf)

Abstract: The scientific productivity, measured as number of publication credits per year, of 105 BS, MS and PhD degree holders at the authors’ institution - a nonprofit international fisheries research organization based in Manila - was studied. All authored and edited items produced by these staff, from 1978 to 1993, presently published or in press were considered, and weights assigned depending on document type, number of pages, and rank of the name in cases of multiple authorship or editorship. The staff’s output of conference papers and technical reports outweighted contributions to the primary (journal) literature. Predictors of productivity were position/salary, education, and age. However, a large unexplained variance remained, suggesting that individual factors largely determine productivity.

Keywords: Authorship, Education, International, Journal, Literature, Papers, Primary, Publication, Research

Simonetti, R., Archibugi, D. and Evangelista, R. (1995), Product and process innovations: How are they defined? How are they quantified? *Scientometrics*, **32** (1), 77-89.

Full Text: [1995\Scientometrics32, 77.pdf](1995/Scientometrics32,%2077.pdf)

Abstract: This paper considers the alternative meanings attributed to the terms product and process innovation, and demonstrates, on the basis of the SPRU database on innovations in Great Britain, how the total number of product and process innovations varies according to the definition adopted. Only 3.1% of the innovations monitored can be univocally labelled as either products or processes, whilst as many as 96.9% of them fall into a grey zone. The authors conclude that these terms, although useful tools of analysis, should be defined more precisely in the studies of the economics of technological change.

Keywords: Alternative, Analysis, Britain, Database, Economics, Empirical-Analysis, Innovation, Sectoral Patterns, Technological Change

? Nicolini, C., Vakula, S., Balla, M.I. and Gandini, E. (1995), Can the assignment of university chairs be automated. *Scientometrics*, **32** (2), 93-107.

Full Text: [1995\Scientometrics32, 93.pdf](1995/Scientometrics32,%2093.pdf)

Abstract: In order to explore the possibility that the assignment of University chairs could be automated, we have carried out a comparative analysis of the relative scientific and technological level of candidates competing nationally for given chairs of first (full professor) and second (associate professor) level, using indicators such as the number of publications and citations in international journals, the number of patents and inventions and few others. This study, contrary to some gloomy opinions, has suggested that at least for what concerns hard science, performances can be measured impartially at least to some extent. Bibliometric indicators, when properly weighted, appear to be effective parameters to monitor degree of excellence in scholastic rating and to establish reliable objective standards. Their utilization, however, to automate the assignment of university chairs appears still questionable and should be limited to the needed provision of computer-assisted selection criteria and reference databank.

Keywords: Analysis, Citations, Criteria, First, Indicators, International, Journals, Opinions, Patents, Publications, Science, Standards, University, Utilization

? Vinkler, P. (1995), Some aspects of the evaluation of scientific and related performances of individuals. *Scientometrics*, **32** (2), 109-116

Full Text: [1995\Scientometrics32, 109.pdf](1995/Scientometrics32,%20109.pdf)

Keywords: Indicators

Notes: UUniversity

Snizek, W.E. (1995), Some observations on the use of bibliometric indicators in the assignment of university chairs. *Scientometrics*, **32** (2), 117-120.

Full Text: [1995\Scientometrics32, 117.pdf](1995/Scientometrics32,%20117.pdf)

Abstract: In their article, ‘Can the Assignment of University Chairs Be Automated?’, Nicolini, Vakula, Balla, and Gandini describe the results of their initial attempts at using multiple bibliometric indicators in order to eventually automate the assignment of University chairs at the full and associate professor levels. The indicators utilized consist of each candidate’s age, years of scientific activity, number of published articles, citation rate and the quality and type of publishing and citing journals. Data concerning these indicators are obtained from both SCI databases and the curriculum vitae of 76 test-candidates. Although the ranking of candidates is shown to be affected by both subfield differences in citation patterns and the weighting factor assigned to the bibliometric indicators tested, some predictive validity is found between the use bibliometric indicators and the independent peer-review of candidates. While these results are encouraging, the authors readily acknowledge the limitations of their efforts and the need to further refine the use of bibliometric indicators, before their employment in the automated assignment of University chairs. My observations concerning the work of Nicolini et al. will take the following form. First, I wish to comment briefly on what I view to be the philosophy behind the efforts of Nicolini et al. Second, I want to mention several positive and potentially negative procedural issues associated with the proposed use of bibliometric indicators in assessing individual scientific accomplishments. and finally, I would like to comment on what I see as some broader, latent consequences, potentially associated with the use of bibliometric measures in the automated assignment of University chairs.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Citation Patterns, Curriculum, Employment, Indicators, Journals, Peer Review, Peer-Review, Philosophy, Publishing, Quality, Ranking, SCI, Validity, Work

? Balaban, A.T. (1995), Can the assignment of university chairs be automated? *Scientometrics*, **32** (2), 121-122.

Full Text: [1995\Scientometrics32, 121.pdf](1995/Scientometrics32,%20121.pdf)

Notes: MModel

Wagner-Döbler, R. (1995), Were has the cumulative advantage gone? Some observations about the frequency-distribution of scientific productivity, of duration of scientific participation, and of speed of publication. *Scientometrics*, **32** (2), 123-132.

Full Text: [1995\Scientometrics32, 123.pdf](1995/Scientometrics32,%20123.pdf)

Abstract: Frequency distributions of scientific productivity are usually based on cross section cuts of the investigated population of scientists. Therefore, some of the registered scientists are involved for the whole period of time, but there are many fractional authors, too. If one compares only scientists active in a specialty for the same length of time, the typical bibliometric skewness of the distribution vanishes. But also the duration of participation of a cohort of scientists which began their career in the same year is not distributed in a Lotkean manner. Furthermore, the speed of publication - which might be a better statistical indicator of scientific capacities than publication output as such - has more similarity to a normal distribution than to a lognormal one.

Keywords: Bibliometric, Indicator, Population, Publication, Similarity, Specialty

? Klaic, B. (1995), Analysis of the scientific productivity of researchers from the Republic of Croatia for the period 1990-1992. *Scientometrics*, **32** (2), 133-152.

Full Text: [1995\Scientometrics32, 133.pdf](1995/Scientometrics32,%20133.pdf)

Abstract: The scientific production of researchers from the Republic of Croatia, consisting of the published papers with addresses of the institutions from Croatia only, was analyzed for the period 1990-1992, covering 2047 SCI, SSCI, and A&HCI registered papers. The source index of SCI has registered 1912 (92.50% of total number of published articles) papers, SSCI 118 (5,71%), and A&HCI 37 (1.79%) papers, respectively. The papers were published in more than 700 different journals, covering 122 scientific subfields. The most frequently used journals are the national Periodicum Biologorum, Croatica Chemica Acta and Collegium Antropologicum with 236 published papers or 11.5%. The largest number of papers have been published in scientific subfields: Biology (146 papers), Chemistry (107), and Physics of Condensed Matter (102). The average paper was published by 3.57 researchers, but subfields of Nuclear Physics (7.40 authors per paper), Immunology (5.67), and Hematology (5.60) were with the highest authorship. The partial contributions of institutions were also determined, and the most productive were Ruder Boskovic Institute with 645.0, the Faculty of Medicine with 396.7, and the Faculty of Science and Mathematics with 201.7 published papers, respectively. The average quality of the used journals were estimated, Institute of Physics, Ruder Boskovic Institute, and the Faculty of Science and Mathematics published their papers in journals with bigger impact factor (higher quality) than average institutions. Publications were divided by the type of papers, most frequent being articles (1778 publications, 86.85%), notes (117, 5.71%) and letters (56, 2.74%), respectively. Scientific subfield distribution of papers published by the most productive institutions were also analyzed.

Keywords: Authorship, Croatia, Impact Factor, Indicators, Institutions, Journals, Papers, Performance, Publications, Quality, SCI, Science, Scientific Production, SSCI, University

? Mccain, K.W. (1995), The structure of biotechnology research-and-development. *Scientometrics*, **32** (2), 153-175.

Full Text: [1995\Scientometrics32, 153.pdf](1995/Scientometrics32,%20153.pdf)

Abstract: The structure of R & D in biotechnology is analysed using co-classification analysis of joint subject heading assignments in Derwent BIOTECHNOLOGY ABSTRACTS and subject profile analysis of 44 highly productive biotechnology-intensive organizations whose patents and publications are indexed therein. A Pathfinder Network Analysis reveals two distinct foci in biotechnology R & D - fermentation and genetic engineering - each linked to relevant products and secondary processes. Multidimensional scaling and cluster analysis identified 5 major groupings of companies, research institutes, and patent-holding organizations arranged along two dimensions - industrial fermentation processes vs genetic engineering and biomedical vs non-biomedical R & D.

Keywords: Analysis, Biomedical, Biotechnology, Cluster Analysis, Co-Heading Analysis, Fermentation, Genetic, Genetic Engineering, Indicators, Patents, Publications, Representations, Research, Scaling, Science Maps, Structure, Tools

? Heine, M.H. (1995), The characterization of text corpora using an input-output schema for citations. *Scientometrics*, **32** (2), 177-194.

Full Text: [1995\Scientometrics32, 177.pdf](1995/Scientometrics32,%20177.pdf)

Abstract: Univariate measures of concentration (or dispersion) can be applied to the description of the citation patterns within a text corpus, and also the citation links between that corpus and an alternative (possibly contextual) literature. To assist in this, a simple data-flow schema introduced by Lano to assist with the design of software can be used to provide an appropriate data-definitional tool. The schema, as applied here, comprises: (1) a matrix of cells containing 0 or 1 values (in its non-diagonal cells) representing within-corpus citations, with the diagonal cells representing the corpus documents, and (2) two associated vectors of cells which record the total numbers of citations that link the corpus documents with an external-to-corpus literature. An initial data-exploration based on an application of this schema to a trial document corpus is reported. On this basis, several provisional conjectures are put forward to attract further research on data of this type. These conjectures include: (1) Concentration amongst citations to corpus items from within a young corpus is less than it is amongst citations by corpus items to that corpus, (2) A young literature corpus imports significantly more information from its external world than it exports to it, and (3) Information transfer from and into contextual literature dominates within-corpus information transfer. The author emphasises that these are conjectures at this stage, not hypotheses.

Keywords: Alternative, Citation, Citation Patterns, Citations, Information, Literature, Record, Research, Schema

? Buchholz, K. (1995), Criteria for the analysis of scientific quality. *Scientometrics*, **32** (2), 195-218.

Full Text: [1995\Scientometrics32, 195.pdf](1995/Scientometrics32,%20195.pdf)

Abstract: One of the major questions in science research is addressed in detail, that is the problem of evaluation of research work both by objective characterization, accessible to proof, and by adequate characterization, referring to the content and cognitive level of the work under investigation. A short discussion of established methods by science indicators as well as by peer review compiles merits and shortcomings of these methods. A short review refers to a few approaches towards the development of criteria for an improved assessment and characterization of research work and their shortcomings are discussed. Notably for the evaluation of medium or low range quality no reliable method is available. Therefore a systematic compilation of criteria which covers the full range of excellence to failure with respect to scientific quality is developed and a comprehensive list of criteria is presented which should provide a basis both for objective and adequate characterization of publications.

Keywords: Assessment, Characterization, Criteria, Development, Evaluation, Indicators, Investigation, Methods, Peer Review, Peer-Review, Publications, Quality, Research, Research Work, Review, Science, Science Indicators, Science Research, Technology Indicators, Work

? Sampson, Z.J. (1995), 40-years of the physical-review and physical-review letters. *Scientometrics*, **32** (2), 219-226.

Full Text: [1995\Scientometrics32, 219.pdf](1995/Scientometrics32,%20219.pdf)

Abstract: This paper measures the increase in the numbers of authors per article in one scientific journal over forty years. The rise in the complexity of science, to which some attribute this growth in multiple authorship, is reflected in the increasing complexity of this simple task over that forty year period. It also discusses the resulting decrease in single authored papers, papers with very large numbers of authors, and predicts future trends.

Keywords: Authorship, Complexity, Growth, Journal, Papers, Science, Trends

? Pudovkin, A.I. and Fuseler, E.A. (1995), Indexes of journal citation relatedness and citation relationships among aquatic biology journals. *Scientometrics*, **32** (3), 227-236.

Full Text: [1995\Scientometrics32, 227.pdf](1995/Scientometrics32,%20227.pdf)

Abstract: Simple quantitative indices of pair-wise journal citation relatedness (based on the numbers of references given to and received from a journal title, which are provided by Science Citation Index database) are translated by an automatic clustering procedure into a meaningful map diagram reflecting topical relatedness of journals within a field of science. Such a map for 60 journals in marine and freshwater biology and related sciences published in 1987 reveals a tight cluster of marine biology journals quite distinct from the freshwater biology journal cluster and from the fisheries cluster. The journals within the marine biology cluster and those with strongest pair-wise links with them can be regarded as the core journals in marine biology. Indices of unilateral citation relatedness are used to obtain diagrams, which we term citograms. The citograms visualize patterns of citation relatedness of a journal (its citing and being cited). Journal self-citation can be meaningfully estimated using the bilateral index of relatedness. Self-citation is high in specialized or regional journal titles. It also appears to be quire substantial in journals of broader scope, which possibly reflect authors’ subjective preferences.

Keywords: Biology, Citation, Clustering, Database, Freshwater, Journal, Journals, Science, Science Citation Index, Sciences, Self-Citation, Topical

Notes: CCountry, Notes: TTopic

Liu, J.M. and Shu, S.Z. (1995), Statistical analysis of astronomical papers of China during 1986-1990. *Scientometrics*, **32** (3), 237-245.

Full Text: [1995\Scientometrics32, 237.pdf](1995/Scientometrics32,%20237.pdf)

Abstract: We present the distribution of astronomical papers published by Chinese authors in 1986 - 1990 across the various subfields of astronomy, the total number of papers produced by each observatory or university during the five years, and the ranking of the observatories by productivity. Our main data base includes 24 journals: 9 foreign ones published in English, 10 Chinese national ones, and 5 Chinese observatory publications. About 70 journals published by Chinese universities have also been consulted. This data base covers up to 90% of all astronomical papers published during this period.

Keywords: China, Chinese, Data Base, Journals, Papers, Publications, Ranking, Universities, University

? Duplenko, Y. and Burchinsky, S. (1995), Computer-aided clustering of citation networks as a tool of mapping of research trends in biomedicine. *Scientometrics*, **32** (3), 247-258

Full Text: [1995\Scientometrics32, 247.pdf](1995/Scientometrics32,%20247.pdf)

Abstract: The use of the cluster analysis in scientometrics is dealt with. The ways of developing citation networks and mapping research field with the help of this method are also presented. The methodology of computer-aided cluster analysis of citation is described which allows to map the structure of a research field and to identify main tendencies of its development.

Keywords: Analysis, Citation, Cluster Analysis, Development, Methodology, Research, Science, Scientometrics, Structure

? Michalos, A.C. (1995), Prices and impact factors of interdisciplinary social-science journals. *Scientometrics*, **32** (3), 259-261.

Full Text: [1995\Scientometrics32, 259.pdf](1995/Scientometrics32,%20259.pdf)

Abstract: An examination of the relationships between journal impact factors and individual subscription prices of interdisciplinary social science journals revealed a very small and statistically nonsignificant negative association.

Keywords: Association, Examination, Impact Factors, Interdisciplinary, Journal, Journal Impact, Journal Impact Factors, Journals, Science, Science Journals, Small

? Schubert, A. (1995), Quantitative Studies of Science in the 80S - Indexes to Current Bibliographies 1-17. *Scientometrics*, **32** (3), 263-367

Full Text: Scientometrics32, 263.pdf

Godin, B., Barker, R.S. and Landry, R. (1995), Besides academic publications: Which sectors compete, or are there competitors. *Scientometrics*, **33** (1), 3-12.

Full Text: [1995\Scientometrics33, 3.pdf](1995/Scientometrics33,%203.pdf)

Abstract: Since its beginning thirty years ago, bibliometrics has mainly studied academic publications. More often, the Science Citation Index (SCI) is treated as a whole, without breakdown of papers by sectors (university, government, industry). However, between 15% and 30% of the SCI publications comes from other sectors than university. We present the first bibliometric analysis of papers broken down by sectors. The data have been used to test the following hypothesis: the share of papers by sectors other than university is increasing, while university’s share is decreasing. The hypothesis is tested for Quebec over the period 1980-1990. It appears that it is true that the share of papers by sectors other than university is increasing. and this is so at a rate greater than that of university’s growth. Quebec’s university sector has decreased its share of papers over the ten-year period from 89.2% to 85.1%. However, university remains the top sector in terms of papers and remains the main partner of each sector in terms of cosignatures.

Keywords: Analysis, Basic Research, Bibliometric, Bibliometric Analysis, Bibliometrics, First, Growth, Innovation, International Scientific Collaboration, Linkage, Papers, Publications, SCI, Science, Science Citation Index, Sector, Technology, University

Pichappan, P. (1995), A dual refinement of journal self-citation measures. *Scientometrics*, **33** (1), 13-21.

Full Text: [1995\Scientometrics33, 13.pdf](1995/Scientometrics33,%2013.pdf)

Abstract: Journal self-citation is one of the crucial bibliometric indicators, which measures the contribution of a journal towards a speciality. Journal self-citation rate is normalised by adapting a two stage refinement. The normalised self-citing rates are compared with external cited rate to know the self and external influence of journals

Keywords: Bibliometric, Bibliometric Indicators, Indicators, Journal, Journals, Self, Self-Citation

? Campanario, J.M. (1995), Using neural networks to study networks of scientific journals. *Scientometrics*, **33** (1), 23-40.

Full Text: [1995\Scientometrics33, 23.pdf](1995/Scientometrics33,%2023.pdf)

Abstract: In this paper a new,approach to study science dynamics is introduced. This approach is based in the use of Kohonen preserving topology maps, a kind of neural network. Four data set consisting in cross-citation matrix are studied using this approach. Relations maps and domains maps are computed for these data sets and interrelationships among journals are studied. This approach allow to stude both, hierarchical journal structure in a given time and evolution of relations among journals in a given time lag.

Keywords: Co-Citations, Dynamics, Evolution, Journal, Journals, Network, Neural Network, Relations, Science, Science-Citation-Index, Structure, Topology-Conserving Maps

? Suraud, M.G., Quoniam, L., Rostaing, H. and Dou, H. (1995), On the significance of data-bases keywords for a large-scale bibliometric investigation in fundamental physics. *Scientometrics*, **33** (1), 41-63.

Full Text: [1995\Scientometrics33, 41.pdf](1995/Scientometrics33,%2041.pdf)

Abstract: We present an automatized bibliometric investigation applied to the field of fundamental research in physics. We briefly describe the scientific context motivating this study and the statistical method used for analyzing the data. We discuss in more detail how we adapted our investigation to the questions motivating this study, namely the identification of relevant groups working in a well defined subfield of physics. We next present the results of our investigation. We particularly focus on an analysis of Index and Free terms, as obtained from the INSPEC data base we used for performing the bibliometric investigation. We discuss the relevance of Index and Free terms by means of a separation between ‘Noise’, ‘Interesting’ and ‘Trivial’ entries. We show that Index and Free terms exhibit somewhat different behaviors when considered as distributions in terms of frequencies of occurrence in the references. We show the particular relevance of Free terms in this analysis. This may be connected to the emerging nature of the subfield of physics under consideration. This shed an interesting light on the respective importance of Index and Free terms, as entries of data bases, in particular in the case of rapidly evolving scientific domains.

Keywords: Analysis, Bibliometric, Bibliometric Investigation, Data Base, Identification, Investigation, Relevance, Research, Separation

Lau, T.Y. (1995), Chinese communication studies: A citation analysis of Chinese communication research in English-language journals. *Scientometrics*, **33** (1), 65-91.

Full Text: [1995\Scientometrics33, 65.pdf](1995/Scientometrics33,%2065.pdf)

Abstract: The study employs citation analysis method to identify the disciplines and active research areas in communication studies on communication systems in China. Moreover, the study seeks to contribute to the methodological issues of citation analysis by including new variables in the analysis. Using Chinese communication research in 11 Chinese/Asian studies journals and 13 journalism/communication journals published in English since 1931, the study found that there were little exchanges between Chinese studies and communication scholars. However, the study showed that by including two variables - theme of articles and academic affiliation of authors, the findings can more accurate demonstrate the relationship between the research activities and disciplines cited.

Keywords: Affiliation, Analysis, China, Chinese, Citation, Citation Analysis, Communication, Journals, Networks, Research, Social-Sciences

Notes: JJournal

Tijssen, R.J.W. and Van Leeuwen, Th.N. (1995), On generalising scientometric journal mapping beyond ISI’s journal and citation databases. *Scientometrics*, **33** (1), 93-116.

Full Text: [1995\Scientometrics33, 93.pdf](1995/Scientometrics33,%2093.pdf)

Abstract: This article presents results of a study on the applicability of journal mapping of knowledge domains beyond the databases produced by the Institute for Scientific Information (ISI). The utility and validity of this generalisation is discussed with an emphasis on its added value in comparison to ‘traditional’ ISI-based journal maps, i.e. those restricted to (predominantly English-language) ISI-covered journals, and journal-to-journal citation data retrieved from ISI’s *Journal Citation Reports*. The mapping methodology was applied to Manufacturing technology and management - a multidisciplinary domain situated on the interface of science and technology. The *International Journal of Production Economics* was singled out as a special case for the validation study of the maps. Results of this study, involving several subject experts, indicate that a journal content-based map was not only far superior to the journal citation map, but also outperformed the map derived from the combination of both types of data. The selection of periodicals from other databases such as COMPENDEX produced a substantial number of additional titles of which only half were also covered by ISI.

Keywords: Citation, Comparison, Institute For Scientific Information, ISI, Journal, Journal Citation Reports, Journals, Knowledge, Knowledge Domains, Management, Methodology, Multidisciplinary, Periodicals, Science, Science and Technology, Technology, Utility, Validation, Validity

Herbertz, H. (1995), Does it pay to cooperate: A bibliometric case-study in molecular-biology. *Scientometrics*, **33** (1), 117-122.

Full Text: [1995\Scientometrics33, 117.pdf](1995/Scientometrics33,%20117.pdf)

Abstract: Various bibliometric studies report that multiinstitutional or multinational authored papers are more frequently cited than papers that come from a single institute. The conclusion, however, that there is a systematic improvement of scientific success by cooperation on every level of scientific research in leading or mediocre research institutes might be misleading: In a citation analysis of 13 well-known research institutes in molecular biology there was no difference in the average citations per paper with regard to cooperations. In a subsample of 7 German institutes that difference found could be explained by selfcitations. In another case, all articles of a two year sample of an excellent journal in molecular biology, the EMBO- Journal, the same phenomenon could be observed: Differences in the average citations per article with regard to cooperations could be explained by selfcitations

Keywords: Analysis, Bibliometric, Bibliometric Studies, Biology, Citation, Citation Analysis, Citations, Cooperation, Journal, Molecular Biology, Papers, Research, Scientific Cooperation, Scientific Research

Notes: TTopic

Yamazaki, S. (1995), Refereeing system of 29 life science journals preferred by Japanese scientists. *Scientometrics*, **33** (1), 123-129.

Full Text: [1995\Scientometrics33, 123.pdf](1995/Scientometrics33,%20123.pdf)

Abstract: The purpose of this paper is to study the referee systems of foreign scientific journals in the field of life sciences preferred by Japanese researchers. This survey has been conducted in response to the need of Japanese authors for current information about the refereeing systems of foreign life science journals. Based on questionnaire data obtained from 29 journal editors, this paper describes the refereeing systems. This survey showed that most Japanese researchers in the field of life sciences tried to submit their papers to prestigious foreign journals with a higher rejection rate. There was a high correlation between the rejection rate and the impact factor in the field of biochemistry and molecular biology.

Keywords: Biochemistry, Biology, Impact Factor, Information, Journal, Journal Editors, Journals, Life, Life Sciences, Molecular Biology, Papers, Questionnaire, Science, Science Journals, Sciences, Scientific Journals, Survey

Braun, T., Brocken, M., Glänzel, W., Rinia, E. and Schubert, A. (1995), Hyphenation of databases in building scientometric indicators: Physics briefs - SCI Based indicators of 13 European countries, 1980-1989. *Scientometrics*, **33** (2), 131-148.

Full Text: [1995\Scientometrics33, 131.pdf](1995/Scientometrics33,%20131.pdf)

Notes: TTopic

Miquel, J.F., Ojasoo, T., Okubo, Y., Paul, A. and Doré, J.C. (1995), World science in 18 disciplinary areas: Comparative evaluation of the publication patterns of 48 countries over the period 1981-1992. *Scientometrics*, **33** (2), 149-167.

Full Text: [1995\Scientometrics33, 149.pdf](1995/Scientometrics33,%20149.pdf)

Abstract: In order to be able to develop indicators that can measure the scientific and technological productivity of a nation, it is helpful to have at one’s command a prior purely descriptive global overview of how various nations stand with respect to each other with regard to world science, i.e., to dispose of a framework for the elaboration of future quantitative studies.

ISI has recently made available a highly comprehensive multidisciplinary database (over 6 million bibliometric entries from 1981 to 1992) that is founded on top-echelon journals and that can form the basis of such a framework. We have in the present study defined a publication pattern per nation that reflects its interest and potential in 18 disciplines and compared the publication patterns of 48 nations by descriptive multivariate analysis, i.e., by measuring the distance between nations in the n-dimensional system. Proximity is a sign of similarity, distance of diversity. Three multivariate methods of distance measurement were used: a hierarchical classification, the distance of each nation from the centre of gravity of the system calculated by χ2-metrics (typicality of behaviour), a bi-plot of the χ2-distances of 46 countries with respect to two reference countries that highlights clusters of nations with similar behaviour.

The resultant plots are open to interpretation by experts. We conclude that three factors, geographical proximity, culture, and economic development are the principal determinants of the publication patterns of nations.

Keywords: Analysis, Behaviour, Bibliometric, Citation, Classification, Culture, Database, Development, Economic Development, Framework, Indicators, ISI, Journals, Measurement, Methods, Multidisciplinary, Nations, Potential, Publication, Science, Similarity, Subfields

? Nagpaul, P.S. (1995), Quasi-quantitative measures of research performance: An assessment of construct-validity and reliability. *Scientometrics*, **33** (2), 169-185.

Full Text: [1995\Scientometrics33, 169.pdf](1995/Scientometrics33,%20169.pdf)

Abstract: This paper argues that research performance is essentially a multidimensional concept which cannot be encapsulated into a single universal criterion. Various indicators used in quantitative studies on research performance at micro or meso-levels can be classified into two broad categories: (i) objective or quantitative indicators (e.g. counts of publications, patents, algorithms or other artifacts of research output) and (II) subjective or qualitative indicators which represent evaluative judgement of peers, usually measured on Likert or semantic differential scales. Because of their weak measurement properties, subjective indicators can also be designated as quasi-quantitative measures. This paper is concerned with the factorial structure and construct validity of quasi-quantitative measures of research performance used in a large-scale empirical study carried out in India. In this study, a reflective measurement model incorporating four latent variables (R and D effectiveness, Recognition, User-oriented effectiveness and Administrative effectiveness) is assumed. The latent variables are operationalized through thirteen indicators measured on 5-point semantic differential scales. Convergent validity, discriminant validity and reliability of the measurement model are tested through LISREL procedure.

Keywords: Effectiveness, Error, Fit, Goodness, India, Indicators, Measurement, Model, Patents, Publications, Qualitative, Reliability, Research, Research Performance, Structure, Validity

Gupta, B.M., Sharma, L. and Karisiddappa, C. R. (1995), Modelling the growth of papers in a scientific specialty. *Scientometrics*, **33** (2), 187-201.

Full Text: [1995\Scientometrics33, 187.pdf](1995/Scientometrics33,%20187.pdf)

Abstract: A growth model of the journal literature is proposed and applied to the growth of the literature of theoretical population genetics (1850-1980).

Keywords: Modeling

? Thomas, P.R. (1995), Size effects in the assessment of discipline-contribution scores: An example from the social-sciences. *Scientometrics*, **33** (2), 203-220.

Full Text: [1995\Scientometrics33, 203.pdf](1995/Scientometrics33,%20203.pdf)

Abstract: Pichappan’s formulation of the Discipline-Contribution Score (DCS) in the identification of core disciplinary journals is applied to social science literature. Modifications are made to Pichappan’s method to cater for problems associated with low citation counts. Further analysis is undertaken to verify Pichappan’s claims concerning the size-independent nature of the DCS score. The proposed modified formulation of the DCS calculation facilitates research into small research fields, and those characterised by low citation rates. The modified equation is tested on business and management literature.

Keywords: Analysis, Business, Citation, Citation Counts, Identification, Journals, Literature, Management, Research, Science, Small

Romanov, A.K. and Terekhov, A.I. (1995), The mathematical modelling of the scientific personnel movement taking into account the productivity factor. *Scientometrics*, **33** (2), 221-231.

Full Text: [1995\Scientometrics33, 221.pdf](1995/Scientometrics33,%20221.pdf)

Abstract: An approach to the dynamic optimization of the age structure of scientific personnel in an organization is presented. The appropriate mathematical model describing the age rotation of scientific workers is formulated and the criterion for maximizing the integral productivity of available scientific personnel over given time horizon is introduced. The criterion is constructed by using such scientometric instrument as the ‘curves of age productivity’. The practical application of suggested approach is demonstrated by means of real example.

Keywords: Mathematical Model, Model, Optimization, Personnel, Scientometric, Structure

Kalyane, V.L. and Munnolli, S.S. (1995), Scientometric portrait of West, T.S. *Scientometrics*, **33** (2), 233-256.

Full Text: [1995\Scientometrics33, 233.pdf](1995/Scientometrics33,%20233.pdf)

Abstract: T. S. West, the internationally well known analytical chemist has been widely recognised as a very successful scientist. His research productivity and collaboration pattern were analysed by years, papers, authorships, and authorwise productivity. The channels of communications used and distribution of articles among channels were found out. He has 410 papers to his credit. The period 1969-70 when he was 42-43 years age was most productive with 41 papers in 1969 and seven single authorship papers in 1970. Quienquennial collaboration coefficients ranged between 0.57 to 1.00, clearly indicating high collaboration team spirit in his research group. His productivity coefficient was 0.45 indicating rapid publication activity during early period of research career. His most prominent collaborators in number of papers were: R. M. Dagnall (92), G. F. Kirkbright (77), R. Belcher (56), K. C. Thompson (19), J. D. Norris (13), and J. F. Alder (11). Top ranking journals, with papers, to which he had contributed were: Anal. Chim. Acta (106), Talanta (84), The Analyst (49), Anal. Chem. (23), and J. Chem. Sec. (20). Publication density was 8.54, publication concentration was 6.25, and average Bradford multiplier was 3.9. High frequency keywords in the titles of the articles were: Atomic fluorescence spectroscopy (51), Atomic absorption spectroscopy (43), and Atomic absorption spectrometry (31). The results indicate his temporal publication productivity and the nature of the research activities were such that he is eminently qualified to be taken as a ‘role model’ for the younger generation to emulate.

Keywords: Absorption, Analytical-Chemistry, Authorship, Bibliometrics, Collaboration, Communication, Communications, Generation, Journals, Model, Papers, Publication, Publication Activity, Ranking, Research, Research Productivity, Science, Spectroscopy

Burton, M.P. (1995), The use of citations matrices to group journals. *Scientometrics*, **33** (2), 257-262.

Full Text: [1995\Scientometrics33, 257.pdf](1995/Scientometrics33,%20257.pdf)

Abstract: A method of grouping journals within a wide discipline area into clusters is proposed, based on a algorithm that attempts to re-order a citations matrix so that it is block diagonal, or block recursive. The algorithm is based on a penalty function which allows one to account for the level of citation, not just the distribution of citations between journals. A case study involving eight economics journals is presented which illustrates the principles involved, but which also highlights the computational problems associated with extending the analysis to larger numbers of journals.

Keywords: Algorithm, Analysis, Case Study, Citation, Citations, Economics, Function, Journals, Principles

Notes: TTopic

Braun, T., Glänzel, W. and Grupp, H. (1995), The scientometric weight of 50 nations in 27 science areas, 1989-1993. Part I. All fields combined, mathematics, engineering, chemistry and physics. *Scientometrics*, **33** (3), 263-293.

Full Text: [1995\Scientometrics33, 263.pdf](1995/Scientometrics33,%20263.pdf)

Keywords: Citation Impact, Datafiles, Publication Output, Relative Indicators

? Raina, D., Gupta, B.M. and Kandhari, R. (1995), Collaboration in Indian physics: A case-study of the macro and micro parametrization of sub-disciplines (1800-1950). *Scientometrics*, **33** (3), 295-314.

Full Text: [1995\Scientometrics33, 295.pdf](1995/Scientometrics33,%20295.pdf)

Abstract: The decade beginning 1920 is an important watershed in the history of physics in modern India. This is evident from the bibliometric data available on the publications in physics between 1800 and 1950. The paper studies the evolution of collaboration in four subdisciplines of physics during this period. In order to do so, two sets of measures of research collaboration have been employed. The collaboration index and collaboration coefficient have been calculated for the sub-disciplines. As far as the micro-parametrization of the discipline is concerned, collaboration measures developed by Egghe are obtained for the research careers of four leading Indian physicists, who were responsible for the institutionalization of physics research in India. In the present case the role of individuals responsible for the institutionalization of physics research is seen to be germane to the explosion of the number of publications in the 1920s. At the conjucture of the history of science and scientometrics, it is evident how the former can endow the latter with a modality of explanation, further, it is evident how scientometrics can inform the efforts of historians of science.

Keywords: Bibliometric, Careers, Collaboration, Evolution, Explanation, Explosion, History, History of Science, India, Publications, Research, Research Collaboration, Science, Scientometrics

? Karki, M.M.S. and Garg, K.C. (1995), Industrial-research in India as viewed through research and industry. *Scientometrics*, **33** (3), 315-328.

Full Text: [1995\Scientometrics33, 315.pdf](1995/Scientometrics33,%20315.pdf)

Abstract: The paper examines the bibliometric characteristics of industrial research activity of India. The study reveals that public-funded R&D is the major contributor of research papers, in Research & Industry while the contribution of in-house R&D centres is lacking. Among the two industrial sectors (Chemical and Engineering), much of the R&D activity, as reflected by published papers, has been in chemical and allied industries. However, there appears to be a significant change in emphasis during the decade studied, namely a decrease in R&D activity in engineering industries with a corresponding increase in ‘miscellaneous’ industries. There is a significant increase in exploratory research. R&D and industry interface is found inadequate. Multiplicity of authorship is gradually increasing. Indian Industrial research is heavily dependent on foreign and non-patent literature.

Keywords: Authorship, Bibliometric, India, Literature, Papers, Research

Tsay, M.Y. (1995), The impact of the concept of postindustrial society and information-society: A citation analysis study. *Scientometrics*, **33** (3), 329-350.

Full Text: [1995\Scientometrics33, 329.pdf](1995/Scientometrics33,%20329.pdf)

Abstract: A detailed quantitative, citation study is made on the concepts of Bell, Machlup, and Drucker related to the economic and social effects of the growth of information-based industries.

Keywords: Citation, Growth, Model, User

? Persson, O. and Beckmann, M. (1995), Locating the network of interacting authors in scientific specialties. *Scientometrics*, **33** (3), 351-366.

Full Text: [1995\Scientometrics33, 351.pdf](1995/Scientometrics33,%20351.pdf)

Abstract: This paper seeks to describe the social circles, networks, or invisible colleges etc that make up a scientific speciality in terms of (mathematically precise) sets generated by documents citation and accessible through the Social Science Citation Index(TM). The document and author sets that encompass a scientific speciality are the basis for some interdependent citation matrices. We illustrate our method of construction of these sets and matrices through an application to the literature on ‘invisible colleges’.

Keywords: Citation, Literature

? Rikken, F., Kiers, H.A.L. and Vos, R. (1995), Mapping the dynamics of adverse drug-reactions in subsequent time periods using indscal. *Scientometrics*, **33** (3), 367-380.

Full Text: [1995\Scientometrics33, 367.pdf](1995/Scientometrics33,%20367.pdf)

Abstract: In this study we have focused on the problem of mapping the dynamics of co-word-matrices from subsequent time periods. Methods for mapping dynamics are important for following trends in research. We have explored the possibilities of a three way multidimensional scaling method, INDSCAL. We are especially interested to find relations between adverse drug reactions and other words in co-word-matrices from a medical field. Second we want to explore whether the relations between adverse drug reactions and other words have changed in subsequent time periods. The results show that INDSCAL can be a useful tool for mapping dynamics.

Keywords: Adverse Drug Reactions, Co-Word Analysis, Count, Drug, Dynamics, Maps, Medical, Network, One Might Wish, Relations, Representations, Research, Scaling, Science Indicators, Texts, Trends

Topic: CCountry

Moed, H.F., de Bruin, R.E. and Van Leeuwen, Th.N. (1995), New bibliometric tools for the assessment of national research performance: Database description, overview of indicators and first applications. *Scientometrics*, **33** (3), 381-422.

Full Text: [1995\Scientometrics33, 381.pdf](1995/Scientometrics33,%20381.pdf)

Abstract: This paper gives an outline of a new bibliometric database based upon all articles published by authors from the Netherlands, and processed during the time period 1980-1993 by the Institute for Scientific Information (ISI) for the *Science Citation Index* (SCI), *Social Science Citation Index* (SSCI) and *Arts & Humanities Citation Index* (A&HCI). The paper describes various types of information added to the database: data on articles citing the Dutch publications, detailed citation data on ISI journals and subfields, and a classification system of publishing main organizations, appearing in the addresses. Moreover, an overview is given of the types of bibliometric indicators that were constructed. Their relationship to indicators developed by other researchers in the field is discussed. Finally, two applications are given in order to illustrate the potentials of the database and of the bibliometric indicators derived from it. The first represents a synthesis of ‘classical’ macro indicator studies at the one hand, and bibliometric analyses of research groups or institutes at the other. The second application gives for the first time a detailed analysis of a country’s publication output per institutional sector.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Citation, Classification, Database, First, Indicator, Indicators, Information, ISI, Journals, Publication, Publications, Publishing, Research, SCI, Scientific Publications, Sector, SSCI, Subfields, Synthesis, The Netherlands

? Campanario, J.M. (1995), Using neural networks to study networks of scientific journals (Vol 33, Pg 23, 1995). *Scientometrics*, **33** (3), 423.

Full Text: [1995\Scientometrics33, 423.pdf](1995/Scientometrics33,%20423.pdf)

Notes: CCountry

Krauskopf, M., Vera, M.I., Krauskopf, V. and Welljams-Dorof, A. (1995), A citationist perspective on science in Latin America and the Caribbean, 1981-1993. *Scientometrics*, **34** (1), 3-25.

Full Text: [1995\Scientometrics34, 3.pdf](1995/Scientometrics34,%203.pdf)

Abstract: The publication productivity and citation record of the Latin American countries are analyzed and evaluated by using adequate databases.

Keywords: Citation, Latin America, Publication, Record

Notes: CCountry

Quesada-Allué, L.A. and Gitlin, D.S. (1995), Scientific output in Argentina 1966-1983. *Scientometrics*, **34** (1), 27-35.

Full Text: [1995\Scientometrics34, 27.pdf](1995/Scientometrics34,%2027.pdf)

Abstract: A scientometric analysis of Argentinian science output during two decades focuses on authorship, as a measure of Argentina scientific size. Comparison is made with more competitive countries like Spain and Brasil. A relative decline in the rate of authors increase was found for Argentina and the derived loss of positions in the publishing authors international ranking was demonstrated. The possible influence of political turmoil and unstable scientific policies is discussed.

Keywords: Analysis, Argentina, Authorship, Chile, Facts, Impressions, International, Publications, Publishing, Ranking, Science, Scientometric, Size, Spain, Technology

? Narvaezberthelemot, N. (1995), An index to measure the international collaboration of developing-countries based on the participation of national institutions: The case of latin-america. *Scientometrics*, **34** (1), 37-44.

Full Text: [1995\Scientometrics34, 37.pdf](1995/Scientometrics34,%2037.pdf)

Abstract: International collaboration is an important ingredient of present-day scientific research. Latin America, for instance, is increasing its production of internationally coauthored publications and, the number of national institutions involved in this activity. An index developed to measure international collaboration by taking into account individual institutional participation resulted in a positive average increase in the production of developing countries (DCs) research. Nonetheless, the degree of institutional participation varies between field and with respect to the country in question. Giving weight to individual institutional participation, could motivate DCs scientists to enhance their role in the international science of the region. Likewise, this index could be developed as ‘quality indicator’ of national institutional performance.

Keywords: Collaboration, Institutions, International, Latin America, Publications, Quality, Research, Science, Scientific Collaboration, Scientific Research

? Russell, J.M. (1995), The increasing role of international-cooperation in science and technology research in Mexico. *Scientometrics*, **34** (1), 45-61.

Full Text: [1995\Scientometrics34, 45.pdf](1995/Scientometrics34,%2045.pdf)

Abstract: Increasing importance is being given to international scientific activities, especially with regard to developing countries. In the present paper, an analysis is made of the studies published by Mexican institutions in coauthorship with foreign colleagues between 1980 and 1990, as registered in mainstream journals. Different characteristics of the collaboration are described, such as research areas, countries and institutions involved, of interest to Mexican policy makers acid scientists, as well as to foreign governments and international organizations sponsoring cooperative agreements with Mexico.

Keywords: Analysis, Coauthorship, Collaboration, Institutions, International, Journals, Latin-America, Mexico, Policy, Research, Scientific Collaboration, Sponsoring

Notes: TTopic, Notes: CCountry

Macias-Chapula, C.A. (1995), Primary health care in Mexico: A ‘non-ISI’ bibliometric analysis. *Scientometrics*, **34** (1), 63-71.

Full Text: [1995\Scientometrics34, 63.pdf](1995/Scientometrics34,%2063.pdf)

Abstract: This work reports the first results of a research in progress on the production, dissemination and impact of the literature on primary health care (PHC), as produced in Mexico during the period 1980-1992. The methodology used involved computerized searches in the MEDLINE, LILACS, and PERIODICA databases to identify the existing Mexican literature in the field. Results indicated a limited dissemination of the Mexican production through conventional databases. A total of 117 references were found in the field. Most of these references (72.65%) corresponded to journal articles. Over 55% of the documents were published by more than one author. Further research in the field as well as the implications of these results to PHC in Mexico are discussed by the author.

Keywords: Care, First, Health, Health Care, Journal, Journal Articles, Literature, MEDLINE, Methodology, Mexico, Primary, Primary Health, Primary Health Care, Research, Work

Meyer, J. B., Charum, J., Granés, J. and Chatelin, Y. (1995), Is it opened or closed? Colombian science on the move. *Scientometrics*, **34** (1), 73-86.

Full Text: [1995\Scientometrics34, 73.pdf](1995/Scientometrics34,%2073.pdf)

Abstract: Using recent original data from three different sources, the article exhibits some strengths and weaknesses of science in Colombia. It shows that research in this country is in a process of growth although recent results of this positive trend are still to be confirmed. Comparing the evolution of science in Colombia with that of Latin America as a whole, describing and explaining its geographical and institutional concentration as well as its thematic distribution, it also reveals the interdependance between science production dynamics and international cooperation programmes. A basic argument is that the development of science in this country, even though it is fragile and erratic, does not lack sound bases. The indicators used suggest indeed an autonomous scientific motion and inspiration which does not contradict the internationalization process of Colombian science but rectifies the picture of an excessively isolated or dependent community that used to be portrayed.

Keywords: Autonomous, Colombia, Community, Cooperation, Development, Dynamics, Evolution, Growth, Indicators, International, International Cooperation, Internationalization, Latin America, Latin-America, Research, Science

Notes: UUniversity

Krauskopf, M., Vera, M.I. and Albertini, R. (1995), Assessment of a university’s scientific capabilities and profile: The case of the faculty of biological sciences of the Pontificia Universidad Católica de Chile. *Scientometrics*, **34** (1), 87-100.

Full Text: [1995\Scientometrics34, 87.pdf](1995/Scientometrics34,%2087.pdf)

Abstract: The scientific capabilities and performance profiles of the Faculty of Biological Sciences of the Pontificia Universidad Católica de Chile were assessed building performance indicators from the ISI’s Chile-National Citation Report, 1981-1992. Consistent with the educational goals of the Faculty, the scientific activity which nurtures graduate training, especially at the doctoral level, was examined field by field and compared to Chilean and World scores. The approach rendered a portrait of the Faculty which depicts, trends, strengths and weaknesses, and standards for the evaluation of future activity. The study shows a very competitive performance in most of the fields, relative to national and world average achievements. A remarkable finding was the outstanding performance in applied fields, such as medical and agricultural sciences, and also in biotechnology, with shows that when good basic science takes place, high level goal oriented research also occurs.

Keywords: Biotechnology, Chile, Evaluation, Graduate, Indicators, Medical, Performance, Research, Science, Sciences, Standards, Training, Trends

Guimarães, J. A. and Humann, Marta C. (1995), Training of human resources in science and technology in Brazil: The importance of a vigorous post-graduate program and its impact on the development of the country. *Scientometrics*, **34** (1), 101-119.

Full Text: [1995\Scientometrics34, 101.pdf](1995/Scientometrics34,%20101.pdf)

Abstract: A national plan, designed to establish and support training and development of human resources for strengthening science and technology activities in Brazil was initiated almost three decades ago. This plan, named PNPG, can be viewed today as a successful program in terms of the quality of its general output. During this period research activity has been institutionalized and a few thousand active groups in several universities and research centers have been consolidated. Numerous technological advances in many areas have been achieved and continue throughout the country. A most impressive result of this effort was the acceleration and improvement of a more productive and internationally competitive agriculture, metallurgical engineering including metal-mechanic industry and paper-cellulose complex exploitation. These results also stimulated better performance of related areas such as agribusiness. The existence of an effective system based on a group of multi-funding agencies was an essential additional factor.

Keywords: Brazil, Development, Human, Quality, Research, Science, Science and Technology, Technology, Training, Universities

Cano, V. (1995), Characteristics of the publishing infrastructure of peripheral countries: A comparison of periodical publications from Latin America with periodicals from the US and the UK. *Scientometrics*, **34** (1), 121-138.

Full Text: [1995\Scientometrics34, 121.pdf](1995/Scientometrics34,%20121.pdf)

Abstract: Bibliometric research can provide science policy makers with indicators of the capacity of a country’s national scientific system to produce printed information. The capacity of the local publishing industry to produce scientific and technical periodical publications reflects the availability of outlets for the dissemination of scientific findings. The present research attempts to evaluate the role of the publishing industry in the level of bibliographic control, and the level of peer review of periodical publications from Latin America. A random search was performed on the 1990 CD-ROM version of *The Serials Directory*, a commercially produced international reference source on periodical publications. A sample of 311 periodicals from Latin America was downloaded to a local database. A similar search was performed on publications from the United States and the United Kingdom for comparison purposes. A random search of 235 publications was downloaded into a local database. Publishers were classified for both samples according to three types: academic, governmental, and commercial. Publications were sorted thematically and indicators of bibliographic control, and of peer review were recorded for both samples. Publications from Latin America showed a very low level of bibliographic control, particularly in the case of the assignment of ISSN numbers, where 58% of the sample studied was published without this element of bibliographic control. This contrasted sharply with the periodicals from the US and UK, where 83% (195) journals had an ISSN number assigned. The involvement of editorial boards in the academic quality of Latin American publications amounted only to 21% of the sample studied. Periodicals from the US and UK reported an editor as responsible for the journal in 40% (93) of the cases. This amount constitutes about double the number of editors reported by Latin American publications. Latin American academic publishers are the most numerous publishers in the sample studied accounting for 37% (114) of the journals studied however, 68% (77) of those editors printed periodicals without a named editor. Governmental publishers are the second largest publisher type. They produced 29% (89) of the journals in the sample. Commercial publishers are responsible for 26% (82) of the journals studied. Publications from the US and UK show a clear predominance of commercial publishers, accounting for 47% (111) of the journals. Academic publishers only produced 29% (68) of the 235 journals in the sample. This clear dominance of the commercial publisher sector shows that publishing in at least the two countries studied is clearly practised as a business enterprise. This is in sharp comparison to the publishing patterns exhibited in Latin America where the academic sector is the most prominent one.

Keywords: Availability, Business, Capacity, Comparison, Database, Indicators, Information, International, Journal, Journals, Latin America, Law, Peer Review, Peer-Review, Periodical, Periodicals, Policy, Publications, Publishing, Quality, Research, Review, Science, Science Policy, Sector, UK, United Kingdom, United States, US

? Vessuri, H. (1995), Recent strategies for adding value to scientific journals in Latin-America. *Scientometrics*, **34** (1), 139-161.

Full Text: [1995\Scientometrics34, 139.pdf](1995/Scientometrics34,%20139.pdf)

Abstract: A recent initiative in some Latin American countries, to define the basic core of credited titles of domestic scientific journals in the different knowledge fields, is reviewed. The policy aim is to strengthen the best journals and to minimize the noise produced by the great number of journals that do a disservice to the authors who publish in them either because of their low quality Dr because even if they are reasonably good, have a very low impact. It is argued that if the exercise were carried out in a rigorous and systematic way in the countries of the region that publish scientific journals, one might eventually obtain a depurated list of Latin American periodical publications. Such list might be useful as a supplement to the catalogues of mainstream journals registered by ISI and other international databases, and could provide ‘valid’ alternatives of publication of results for Latin American researchers and for authors of other regions active in subjects in which the countries of the region have significant scientific contributions, It might also help to provide a better indication of the total publishing activity of Latin American countries.

Keywords: Alternatives, Developing-Countries, International, ISI, Journals, Knowledge, Latin America, Periodical, Policy, Publication, Publications, Publishing, Quality, Science, Scientific Journals

? Bonitz, M. (1995), Comments on merton, Robert, K., recipient of the 1995 Derek-Desolla-Price-Award. *Scientometrics*, **34** (2), R3-R6.

Full Text: [1995\Scientometrics34, R3.pdf](1995/Scientometrics34,%20R3.pdf)

Keywords: Science

? Lepair, C. (1995), Speech on the occasion of the presentation of the 1995 Derek-Desolla-Price-Award to Prof Dr Vanraan, A.F.J. at the ISSI Conference Held at River Forest, Illinois, on June 10, 1995. *Scientometrics*, **34** (2), R7-R10.

Full Text: [1995\Scientometrics34, R7.pdf](1995/Scientometrics34,%20R7.pdf)

Keywords: Combined Cocitation, Illinois, Representations, Science Maps, Scientific Literatures, Word Analysis

? Kostoff, R.N. (1995), Federal, research impact assessment: Axioms, approaches, applications. *Scientometrics*, **34** (2), 163-206.

Full Text: [1995\Scientometrics34, 163.pdf](1995/Scientometrics34,%20163.pdf)

Abstract: This paper describes the practice of Federal research impact assessment. Evaluation of research impact is described for three cases: Research selection, where the work has not yet been performed, Research review, where work and results are ongoing, and Ex-post research assessment, where research has been completed and results can be tracked. Retrospective methods (such as projects Hindsight an TRACES), qualitative methods (such as peer review), and quantitative methods (such as cost-benefit analysis and bibliometrics) are described. While peer review in its broadest sense is the most widely used method in research selection, review, and ex-post assessment, it has its deficiencies, and there is no single method which provides a complete impact evaluation.

Keywords: Analysis, Assessment, Bibliometrics, Cost Benefit, Evaluation, Methods, Peer Review, Peer-Review, Practice, Qualitative, Qualitative Methods, Quantitative Methods, Research, Research Assessment, Review, Work

Braun, T., Glänzel, W. and Grupp, H. (1995), The scientometric weight of 50 nations in 27 science areas, 1989-1993. Part II. Life sciences. *Scientometrics*, **34** (2), 207-237.

Full Text: [1995\Scientometrics34, 207.pdf](1995/Scientometrics34,%20207.pdf)

Keywords: Citation Impact, Datafiles, Publication Output, Relative Indicators

? Baldi, S. and Hargens, L.L. (1995), Reassessing the n-rays reference network: The role of self citations and negative citations. *Scientometrics*, **34** (2), 239-253.

Full Text: [1995\Scientometrics34, 239.pdf](1995/Scientometrics34,%20239.pdf)

Abstract: In his article ‘Networks of Scientific Papers’, Price argued that the N-rays reference network exhibits characteristics one would expect for a cumulative and rapidly developing research area. Although subsequent researchers have questioned Price’s characterization of the N-rays network, there have been no replications of Price’s work for either the N-rays literature or for any other literature. We reexamine the N-rays reference network, this time distinguishing negative citations and self citations from other citations. Although previous studies of negative and self citations show they are relatively infrequent in scientific literatures, we find that both are very prominent in the N-rays literature. In addition, we show that self citations comprise most of the ‘recency effect’ observed in the N-rays reference network, and that the high level of self citations in the N-rays literature results primarily from the character of the journal that published the majority of the N-rays papers. Our findings therefore support those who have been skeptical about Price’s claim that the N-rays reference graph exemplifies basic characteristics of the structure of scientific literatures.

Keywords: Characterization, Citations, Journal, Literature, Network, Papers, Price,Derek, Research, Self, Structure, Work

? Cunningham, S.J. and Bocock, D. (1995), Obsolescence of computing literature. *Scientometrics*, **34** (2), 255-262.

Full Text: [1995\Scientometrics34, 255.pdf](1995/Scientometrics34,%20255.pdf)

Abstract: A multisynchronous obsolescence study has been performed on two computing journals that publish on technical aspects of computer system management (networks and operating systems). This area of computer science is found to have a relatively high obsolescence rate (a median citation rate of four years). This rate is similar to that of fields in engineering and the technology-dependent ‘hard’ sciences.

Keywords: Citation, Journals, Management, Obsolescence, Science, Sciences

? Nagpaul, P.S. and Sharma, L. (1995), Science in the eighties: A typology of countries based on interfield priorities. *Scientometrics*, **34** (2), 263-283.

Full Text: [1995\Scientometrics34, 263.pdf](1995/Scientometrics34,%20263.pdf)

Abstract: This paper seeks to compare the research priorities of thirty three countries in five macrofields (Physics, Chemistry Biology, Mathematics and Engineering & Technology) in two time spans: 1980-1984 and 1985-1989. Comparative analysis is based on the distribution of publications in different fields. Since the raw counts of publications are confounded by the size of the countries and the size of the subject fields, a relative index - Research Priority Index (PI) - is computed for cross-national comparisons. Correspondence analysis is applied to the asymmetrical matrices of priority profiles to reveal the structure of multivariate relationships between countries and fields. The configurations for the two time-spans, obtained-through correspondence analysis, are compared to reveal the dynamics of research priorities of these countries.

Keywords: Analysis, Correspondence Analysis, Dynamics, Indicators, Publications, Research, Size, Structure

? Egghe, L., Rao, I.K.R. and Rousseau, R. (1995), On the influence of production on utilization functions: Obsolescence or increased use. *Scientometrics*, **34** (2), 285-315.

Full Text: [1995\Scientometrics34, 285.pdf](1995/Scientometrics34,%20285.pdf)

Abstract: We study the influence of production on utilization functions. A concrete example of this is the influence of the growth of literature on the obsolescence (aging) of this literature. Here, synchronous as well as diachronous obsolescence is studied. Assuming an increasing exponential function for production and a decreasing one for aging, we show that, in the synchronous case, the larger the increase in production, the larger the obsolescence. In the diachronous case the opposite relation holds: the larger the increase in production the smaller the obsolescence rate. This has also been shown previously by Egghe but the present proof is shorter and yields more insight in the derived results. If a decreasing exponential function is used to model production the opposite results are obtained. It is typical for this study that there are two different time periods: the period of production (growth) and - per year appearing in the production period - the period of aging (measured synchronously and diachronously). The interaction of these periods is described via convolutions (discrete as well as continuous).

Keywords: Aging, Citation Age, Concrete, Function, Functions, Growth, Interaction, Literature, Model, Obsolescence, Time, Utilization

Notes: CCountry

Cozzens, S. (1995), U.S. research assessment: Recent developments. *Scientometrics*, **34** (2), 351-362.

Full Text: [1995\Scientometrics34, 351.pdf](1995/Scientometrics34,%20351.pdf)

Abstract: Over the last decade, ex post research assessment at the program level in the United States has seemed much less active than the equivalent activities in Europe, both west and east. This seeming lull was the result of a decline in program evaluation activity across the U.S. government in the 1980s, which slowed the rate of formal evaluations. Program review activities within agencies, however, were common, especially at such mission-oriented research supporting organizations as the Department of Energy and the Office of Naval Research. Review processes at these agencies relied primarily on expert assessment, sometimes at the project level, supplemented by user inputs. Quantitative performance measures were seldom used. That situation is about to change. In 1993, Congress passed the Government Performance and Results Act, which requires all agencies including those support research to set quantitative performance targets and report annually on their progress toward them. Agencies with clear technological goals are rapidly developing sets of indicators for this use, including peer assessments, bibliometric measures including patents, and customer satisfaction ratings. But fundamental research agencies do not find such measures satisfactory, and are just beginning to develop alternative ones.

Cunion, K.M. (1995), UK government departments experience of RT & D programme evaluation and methodology. *Scientometrics*, **34** (2), 363-374.

Full Text: [1995\Scientometrics34, 363.pdf](1995/Scientometrics34,%20363.pdf)

Abstract: The UK Department of the Environment is responsible for a range of policy issues within Government related to many aspects of the environment in its broadest sense. It spends about £ 100 M annually on Science and Technology in support of its policy functions. Over recent years a system of research assessment has been established which consists of the development of ROAME statements for the appraisal of programmes and regular independent evaluation of the success and impact of the research on the basis of a five year cycle. The mechanisms and process of the assessment system are described. Effective evaluation of policy-oriented research programmes has provided valuable information to the Department on the success and impact of the research, and guidance on future direction and balance of the programmes.

Gonda, K. and Kakizaki, F. (1995), Research, technology and development evaluation, developments in Japan. *Scientometrics*, **34** (2), 375-389.

Full Text: [1995\Scientometrics34, 375.pdf](1995/Scientometrics34,%20375.pdf)

Abstract: The research, technology and development (RTD) evaluation in terms of science and technology policy has come to be important in stimulating research activities and in continuously keeping the vitality and the higher quality of research in RTD institutions. There are two criteria on the RTD evaluation, i.e., in-house evaluation from the stand point of RTD management and independent macroscopic evaluation for the decision making of companies and/or policy making for science and technology policy.

The most important point for RTD evaluation in the former criteria is in the mission itself. RTD in universities, public research institutes, and enterprises have different objectives and characteristics. Therefore, the mission and methodology of RTD evaluations should be different, by categorized type and objectives of research institutions, and be developed in-house. Results of RTD evaluations should be fed back to researchers or engineers and disclosed principally if the mission was to stimulate knowledge creation through RTD activities.

The in-house RTD evaluation can be classified in general into three categories: prior evaluation, mid-term review, and ex-post facto review. The methodologies to evaluate RTD in each phase of the RTD process are different, even among those institutes categorized into the same type such as national and regional research institutes. In this paper, two cases of RTD evaluation a) in Riken, which was founded in 1917 as a private research foundation and later reorganized as a semi-public research corporation of the Science and Technology-Agency, b) in regional public research institutes.

RTD evaluation from the view point of policy assessment of governmental science and technology policy is discussed through analysis of data obtained by the survey of research activities in regional public research institutes. It can be concluded that developments and introduction of RTD evaluation as a new management system in these institutes is improving the research environment and advancing the quality of research. The differences of RTD evaluation between a Center of Excellence (COE) such as Riken and local technology centers, will be compared and the policy implication of RTD evaluation will also be discussed in terms of promotion of science and technology.

Notes: CCountry

Helander, E. (1995), Evaluation activities in the Nordic countries. *Scientometrics*, **34** (2), 391-400.

Full Text: [1995\Scientometrics34, 391.pdf](1995/Scientometrics34,%20391.pdf)

Abstract: There has been extensive experience with evaluations in the Nordic countries. The paper gives a brief overview of work related to: evaluations of research fields, bibliometric studies, evaluations of research programmes, performance of research institutes, evaluation of bodies supporting research, evaluation of universities, indicators and databases.

Evaluations of whole areas of research started in the Nordic countries in the early 1980’s. Another Nordic speciality is the evaluation of research-funding bodies. These evaluations comprise the Swedish Council for Planning and Co-ordination of Research, the Norwegian Research Council for Science and Humanities, the Academy of Finland and the Technology Development Centre (TEKES).

Many research programmes, research institutes and more narrow research fields have been evaluated in the Nordic countries. The evaluations have covered the tasks, performance and structure of these organisations. Lately, whole universities have been evaluated. A number of theoretical and methodological studies on evaluation have been published. Indicators of scientific, technological and educational performance and output have been developed in the Nordic countries. The paper deals mainly with ex post and to some extent also mid-term evaluations. However, ex ante evaluation, including peer review, has actively been developed and applied in the Nordic countries, though these developments lie outside the scope of this paper.

Typical for many Nordic evaluations is the use of foreign evaluators. Others have been based on surveys with potential users of research results and the scientists involved. Some of the evaluations have combined these approaches. Bibliometric studies have been performed parallel with some of the evaluations. Other bibliometric studies have compared the performance of the Nordic countries in an international perspective. In most cases the results of the evaluations are actively made public. Many of the evaluations combine an assessment of quality and relevance.

According to Nordic experiences important conditions for useful evaluations are: credibility implying the use of impartial and recognised experts and professionally done surveys, careful timing, active publicising of evaluation results, transparency of evaluation procedure, concrete measures and action following the evaluation.

When possible data required for the evaluation should be collected already in connection with the application or the report of the projects.

? Gabolde, I. (1995), First international conference on the evaluation of research technology and development - 26, 27 & 28 April 1995, Thessaloniki, Greece - Opening address. *Scientometrics*, **34** (3), 317-320

Full Text: [1995\Scientometrics34, 317.pdf](1995/Scientometrics34,%20317.pdf)

Keywords: Development, Evaluation, Greece, International, Research, Technology

? Piquer, C.R. (1995), Invited speech. *Scientometrics*, **34** (3), 321-323.

Full Text: [1995\Scientometrics34, 321.pdf](1995/Scientometrics34,%20321.pdf)

? Bach, L., CondeMolist, N., Ledoux, M.J., Matt, M. and Schaeffer, V. (1995), Evaluation of the economic effects of Brite-Euram programmes on the European industry. *Scientometrics*, **34** (3), 325-349.

Full Text: Scientometrics34, 325.pdf

Abstract: This article deals with an evaluation performed by BETA group about the economic effects of EU R & D programmes (Brite, Euram and Brite-Euram I) on the European industry. The approach used is based on an original methodology designed by BETA, which aims at evaluating those effects at a micro level (i.e. the participants to the programmes) by means of direct interviews of 176 partners involved in 50 projects. The definition of these economic effects is firstly described, as well as the different steps of the evaluation work. Then the overall results of the study are presented, showing the importance of both ‘direct’ and ‘indirect’ observed effects in monetary terms. Finally, some more detailed results highlight the positive impact of some aspects of the organization structure set up for the analyzed R & D projects on the amount of observed effects: i) the participation of a university lab, ii) the participation of at least one partner involved in a fundamental research work, iii) the diversity of research tasks over a scale ranging from fundamental research to industrialization work, iv) the combination of ‘user-type’ and ‘producer-type’ of activity in one given organisation (integration effect) or in one given project (consortia effect), etc.

Keywords: EU, Evaluation, Integration, Interviews, Methodology, Research, Research Work, Structure, University, Work

Cozzens, S. (1995), U.S. research assessment: Recent developments. *Scientometrics*, **34** (3), 351-362.

Full Text: [1995\Scientometrics34, 351.pdf](1995/Scientometrics34,%20351.pdf)

Abstract: Over the last decade, ex post research assessment at the program level in the United States has seemed much less active than the equivalent activities in Europe, both west and east. This seeming lull was the result of a decline in program evaluation activity across the U.S. government in the 1980s, which slowed the rate of formal evaluations. Program review activities within agencies, however, were common, especially at such mission-oriented research supporting organizations as the Department of Energy and the Office of Naval Research. Review processes at these agencies relied primarily on expert assessment, sometimes at the project level, supplemented by user inputs. Quantitative performance measures were seldom used. That situation is about to change. In 1993, Congress passed the Government Performance and Results Act, which requires all agencies including those support research to set quantitative performance targets and report annually on their progress toward them. Agencies with clear technological goals are rapidly developing sets of indicators for this use, including peer assessments, bibliometric measures including patents, and customer satisfaction ratings. But fundamental research agencies do not find such measures satisfactory, and are just beginning to develop alternative ones.

Keywords: Alternative, Assessment, Bibliometric, Europe, Evaluation, Indicators, Patents, Program Evaluation, Research, Research Assessment, Review, Satisfaction, United States, US

Cunion, K.M. (1995), UK government departments experience of RT & D programme evaluation and methodology. *Scientometrics*, **34** (3), 363-374.

Full Text: [1995\Scientometrics34, 363.pdf](1995/Scientometrics34,%20363.pdf)

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Keywords: Assessment, Development, Environment, Evaluation, Functions, Information, Methodology, Policy, Research, Research Assessment, UK

Gonda, K. and Kakizaki, F. (1995), Research, technology and development evaluation, developments in Japan. *Scientometrics*, **34** (3), 375-389.

Full Text: [1995\Scientometrics34, 375.pdf](1995/Scientometrics34,%20375.pdf)

Abstract: The research, technology and development (RTD) evaluation in terms of science and technology policy has come to be important in stimulating research activities and in continuously keeping the vitality and the higher quality of research in RTD institutions. There are two criteria on the RTD evaluation, i.e., in-house evaluation from the stand point of RTD management and independent macroscopic evaluation for the decision making of companies and/or policy making for science and technology policy.

The most important point for RTD evaluation in the former criteria is in the mission itself. RTD in universities, public research institutes, and enterprises have different objectives and characteristics. Therefore, the mission and methodology of RTD evaluations should be different, by categorized type and objectives of research institutions, and be developed in-house. Results of RTD evaluations should be fed back to researchers or engineers and disclosed principally if the mission was to stimulate knowledge creation through RTD activities.

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RTD evaluation from the view point of policy assessment of governmental science and technology policy is discussed through analysis of data obtained by the survey of research activities in regional public research institutes. It can be concluded that developments and introduction of RTD evaluation as a new management system in these institutes is improving the research environment and advancing the quality of research. The differences of RTD evaluation between a Center of Excellence (COE) such as Riken and local technology centers, will be compared and the policy implication of RTD evaluation will also be discussed in terms of promotion of science and technology.

Keywords: Analysis, Assessment, Criteria, Decision Making, Decision-Making, Development, Enterprises, Environment, Evaluation, Institutions, Japan, Knowledge, Management, Methodology, Policy, Promotion, Quality, Research, Review, Science, Science and Technology, Science and Technology Policy, Survey, Technology, Universities

? Helander, E. (1995), Evaluation activities in the Nordic countries. *Scientometrics*, **34** (3), 391-400.

Full Text: [1995\Scientometrics34, 391.pdf](1995/Scientometrics34,%20391.pdf)

Abstract: There has been extensive experience with evaluations in the Nordic countries. The paper gives a brief overview of work related to: evaluations of research fields, bibliometric studies, evaluations of research programmes, performance of research institutes, evaluation of bodies supporting research, evaluation of universities, indicators and databases. Evaluations of whole areas of research started in the Nordic countries in the early 1980’s. Another Nordic speciality is the evaluation of research-funding bodies. These evaluations comprise the Swedish Council for Planning and Co-ordination of Research: the Norwegian Research Council for Science and Humanities, the Academy of Finland and the Technology Development Centre (TEKES). Many research programmes, research institutes and more narrow research fields have been evaluated in the Nordic countries. The evaluations have covered the tasks, performance and structure of these organisations. Lately, whole universities have been evaluated. A number of theoretical and methodological studies on evaluation have been published. Indicators of scientific, technological and educational performance and output have been developed in the Nordic countries. The paper deals mainly with ex post and to some extent also mid-term evaluations. However, ex ante evaluation, including peer review, has actively been developed and applied in the Nordic countries, though these developments lie outside the scope of this paper. Typical for many Nordic evaluations is the use of foreign evaluators. Others have been based on surveys with potential users of research results and the scientists involved. Some of the evaluations have combined these approaches. Bibliometric studies have been performed parallel with some of the evaluations. Other bibliometric studies have compared the performance of the Nordic countries in an international perspective. In most cases the results of the evaluations are actively made public. Many of the evaluations combine an assessment of quality and relevance. According to Nordic experiences important conditions for useful evaluations are: credibility implying the use of impartial and recognised experts and professionally done surveys, careful timing, active publicising of evaluation results, transparency of evaluation procedure, concrete measures and action following the evaluation. When possible data required for the evaluation should be collected already in connection with the application or the report of the projects.

Keywords: Assessment, Bibliometric, Bibliometric Studies, Bodies, Concrete, Credibility, Evaluation, Finland, Indicators, International, Peer Review, Peer-Review, Potential, Quality, Relevance, Research, Research Funding, Review, Structure, Transparency, Universities, Work

? Hills, P. (1995), PREST’s experience of evaluation. *Scientometrics*, **34** (3), 401-414.

Full Text: [1995\Scientometrics34, 401.pdf](1995/Scientometrics34,%20401.pdf)

Abstract: PREST’s experience of evaluation is not as an isolated activity, but as one that has grown out of, and is still embedded in, a broader programme of work on science policy and management. This reflects a conviction that evaluation should be embedded in a wider management system including verifiable objectives and sound feedback mechanisms. The key to successful evaluation is meticulous planning and evaluation design. PREST’s evaluation work has been based mostly on surveys of opinion supplemented by statistical data. In any evaluation the different actors may all agree overtly on their objectives, but covertly have different and incompatible aims. In this situation PREST apply transparent principles of procedure. Evaluation has had a significant effect on the science and technology management culture. In a few cases it is possible to distinguish a direct link between evaluation findings and subsequent decisions. Usually, however, it is difficult to do so with precision, because evaluation is but one of several influences on policy development. The demand for evaluation will probably intensify, perhaps including simpler, more automatic approaches. There may also be an increased interest in more refined qualitative approaches.

Keywords: Culture, Demand, Development, Evaluation, Management, Planning, Policy, Policy Development, Principles, Qualitative, Science, Science and Technology, Science Policy, Technology, Technology Management, Work

? Johnston, R. (1995), Research impact quantification. *Scientometrics*, **34** (3), 415-426.

Full Text: [1995\Scientometrics34, 415.pdf](1995/Scientometrics34,%20415.pdf)

Abstract: The development of methods for the quantification of research impact has taken a variety of forms: the impact of research outputs on other research, through various forms of citation analysis, the impact of research and technology, through patent-derived data, the economic impact of research projects and programs, through a variety of cost-benefit analyses, the impact of research on company performance, where there is no relationship with profit, but a strong positive correlation with sales growth has been established, and calculations of the rates of social return on the investment in research. However, each of these approaches, which have had varying degrees of success, are being challenged by substantial revision in the understanding of the ways in which research interacts, and contributes to, other human activities. First, advances in the sociology of scientific knowledge have revealed the complex negotiation processes involved in the establishment of research outcomes and their meanings. In this process, citation is little more than a peripheral formalisation. Second, the demonstration of the limitations of neo-classical economics in explaining the role of knowledge in the generation of wealth, and the importance of learning processes, and interaction, in innovation within organisations, has finally overturned the linear model on which so many research impact assessments have been based. A wider examination of the political economy of research evaluation itself reveals the growth of a strong movement towards managerialism, with the application of a variety of mechanisms - foresight, priority setting, research evaluation, research planning - to improve the efficiency of this component of economic activity. However, there are grounds for questioning whether the resulting improved efficiencies have, indeed, improved overall performances. A variety of mechanisms are currently being experimented with in a number of countries which provide both the desired accountability and direction for research, but which rely less on the precision of measures and more on promoting a research environment that is conducive to interaction, invention, and connection.

Keywords: Analysis, Citation, Citation Analysis, Cost Benefit, Development, Economics, Efficiency, Environment, Evaluation, Examination, Foresight, Generation, Growth, Human, Innovation, Interaction, Knowledge, Learning, Methods, Model, Outcomes, Planning, Profit, Research, Research Evaluation, Sociology, Technology, Understanding

? Kameoka, A. (1995), Evaluating research projects at Toshiba. Designing a conceptual framework of evaluating research and technology development (RTD) programs. *Scientometrics*, **34** (3), 427-439.

Full Text: [1995\Scientometrics34, 427.pdf](1995/Scientometrics34,%20427.pdf)

Abstract: Toshiba, a broadly-based electric/electronics manufacturer, operates diversified businesses. A sophisticated research and technology management system supports those businesses based on a research and technology development (RTD) organization consisting of three layers: corporate, business group, and divisional laboratories. Evaluation of RTD projects is varied in accordance with their characteristics. To promote future inter-divisional business, the Corporate Incentive Program (CIP) funds corporate projects which are authorized and evaluated by the Corporate Technology Committee (CTC). In parallel, under the Corporate Strategic Program (CSP), committees monitor and evaluate specific, rapidly-advancing technologies so as to promote early acquisition and diffusion. Additionally, transnational strategic alliances (TSAs) are promoted on the basis of their merits and in accordance with Toshiba’s corporate philosophy of Competition, Cooperation and Complementarity (CC&C). The corporate Research and Development Center (RDC) conducts pre- and intermediate evaluations as part of the Long- and Middle-range Planning every year. When new technologies are transferred to the business divisions, post-evaluation starts and future monetary impacts are estimated, subsequently actual monetary contributions are monitored annually. Another style of pre-evaluation can be observed at the RDC in the Exploratory Programs by the Young (EPY). First, some actual cases at Toshiba are introduced. Next, discussion is extended to the evaluation framework, the corporate technology model and RTD productivity Also noted is the importance of recognizing that the consumer is the ultimate evaluator and that evaluation-quality is improved by feedback from the market. Concept creation and target clarification must come first, only then does the evaluation make sense.

Keywords: Business, Development, Diffusion, Evaluation, First, Framework, Management, Market, Model, Philosophy, Research, Technologies, Technology, Technology Management

? Krull, W. (1995), The Max Planck experience of evaluation. *Scientometrics*, **34** (3), 441-450.

Full Text: [1995\Scientometrics34, 441.pdf](1995/Scientometrics34,%20441.pdf)

Abstract: The Max-Planck-Gesellschaft (MPG) is a nonprofit organization founded in 1948 as a successor to the Kaiser-Wilhelm-Gesellschaft, which was originally established in 1911. Institutes run by the MPG are mainly devoted to basic research, to a large extent in the sciences and, to a smaller extent, in the humanities. In contrast to the university system, which must cover all academic disciplines, the MPG can concentrate its funds and its energy on selected key areas of basic research. In all of the decision making processes concerning structural or institutional changes as well as the reallocation of resourses, evaluation has a crucial role to play. The paper outlines the various ways and levels of quality assessment within the Max Planck system. in particular, it emphasizes the Importance of ex ante-evaluation, and the need for an assessment of ongoing research work at regular intervals. Furthermore, the strengths and weaknesses of quantitative indicators are discussed, and, finally, some principles for policy-relevant evaluations formulated.

Keywords: Assessment, Changes, Concentrate, Decision Making, Decision-Making, Evaluation, Humanities, Indicators, Intervals, Principles, Quality, Research, Research Work, Sciences, University, Work

? Kyriakou, D. (1995), Macroeconomic aspects of S/T programme evaluation. *Scientometrics*, **34** (3), 451-459.

Full Text: [1995\Scientometrics34, 451.pdf](1995/Scientometrics34,%20451.pdf)

Abstract: Understanding the macroeconomic aspects of S/T programme evaluation exercises must be anchored in exploring S/T and its impact in the context of the modern competitive economy, starting at the level of the firm and moving up to the country and EU regional level. Whereas monitoring focuses on the continuous managerial review of project operations, evaluation is concerned with what is being achieved, with maximizing the programme’s impact, and with providing guidelines for new ones. The economic context and the placement of S/T in it, in crucial in both ex-ante evaluation, setting goals and projecting evolution corridors, as well as ex-post evaluation of proximity to targets, and/or assessment/updating of projected technological and economic paths followed. The paper will briefly draw this connection and then proceed to explore the multi-level interface between S/T and the economic context, whose characteristics should inform ex-ante and ex-post evaluation efforts. Particular emphasis will be placed on the role of S/T - and hence in evaluating S/T programmes - visa-vis the effects of S/T on market structure, sustainability and EU cohesion. S/T will be viewed in terms of its projected effects on the viability of monopolistic/oligopolistic arrangements, and on the incontestability of markets, namely the ability of incumbents to deter entry by new challengers. It will be also argued that S/T is, and should be, the bridge linking growth and sustainability, the two towering preoccupations that are often deemed to be at odds. Finally, and most immediately critical for the EU, the vicissitudes of cohesion in the EU will be explored, and the role of S/T in alleviating them will be underscored. Successful and properly evaluated S/T programmes can help steer the EU away from the tensions generated by asymmetric shocks to liberalizing, integrating economies, specializing on the basis of comparative advantage.

Keywords: EU, Evaluation, Evolution, Growth, Guidelines, Market, Markets, Review, Structure, Sustainability

? Kuhlmann, S. (1995), German government department’s experience of RT&D programme evaluation and methodology. *Scientometrics*, **34** (3), 461-471.

Full Text: [1995\Scientometrics34, 461.pdf](1995/Scientometrics34,%20461.pdf)

Abstract: In Germany the interest in the evaluation of RT & D programmes has increased markedly in the recent past, not least because of cut-backs in public budgets, which put-considerable pressure on prioritising and posterioritising of financially effective state intervention. The paper reports on a comprehensive analysis of evaluation practice up till now in the field of RT & D programmes in Germany: within the framework of a ‘Metaevaluation’, the Federal Ministry for Research and Technology (BMFT) had over 50 evaluation studies, which it had commissioned since 1985, documented and critically analysed. On the basis of this analysis and its recommendations, a rough outline for a systematised future evaluation practice has been developed and discussed. Reflections on the basic meaning of evaluation, then which basic functions evaluation studies can fulfil during planning and implementation of RT & D policy measures for government departments, for policy-makers and for the public, were considered. In order to achieve a minimum of compatibility for evaluation activities in the future, a ‘Basic Pack’ of standards for the implementation of evaluation studies was developed (as regards evaluation planning, choice of evaluators, content/scope/range, methods and indicators, editing and utilising the results), and more ambitious possibilities for use were discussed (e.g. combination of technology foresight and ex ante policy analyses).

Keywords: Analysis, Evaluation, Evaluation Studies, Foresight, Framework, Functions, Germany, Indicators, Methodology, Methods, Planning, Policy, Practice, Pressure, Recommendations, Standards, Technology, Technology Foresight

? Laredo, P. (1995), Structural effects of EC RT&D programmes. *Scientometrics*, **34** (3), 473-487.

Full Text: [1995\Scientometrics34, 473.pdf](1995/Scientometrics34,%20473.pdf)

Abstract: Taking advantage of both ‘vertical’ evaluations (of the JOULE and MHR programmes) and of the ‘transversal’ study of the effects of all shared-cost programmes in France, the paper argues that such actions have already built large, heterogeneous, trans-border networks, out of which most are nearly stabilized but still in a learning process about collaborative research practices. It also shows that most networks fall under a limited set of collaborative patterns which focus on different outcomes and, in turn, have different structural effects. It, in turn, questions both the articulation and implementation mechanisms of the present framework programme.

Keywords: Collaborative Research, EC, Framework, France, Learning, Outcomes, Research

? Narin, F. (1995), Patents as indicators for the evaluation of industrial research output. *Scientometrics*, **34** (3), 489-496.

Full Text: [1995\Scientometrics34, 489.pdf](1995/Scientometrics34,%20489.pdf)

Abstract: Patent indicators are used in the evaluation of industrial research at many different levels of aggregation. They are used in policy-level applications to look at industrial research capability from a national or regional viewpoint comparing, for example, EU regional technology with that of Japan and North America. They are used in strategic-level applications to look at industrial research from a company viewpoint. For example, CHI Research, Inc. has used them to compare auto company research output company-by-company and technology-by-technology. They are used in tactical-level applications, typically involving technology tracing - where the performance of research groups is measured against one another within the domain of a specific technology. At the tactical level these indicators can characterize industrial research in three planes or stages: The early Precursor Plane, the current Technology Plane and the future-oriented Successor Plane. Finally, at the most precise level of evaluation, patent indicator techniques are now beginning to be used in the United States in establishing the value of patent portfolios for cross-licensing purposes, and in patent infringement litigation, where citation techniques demonstrate the importance and utility of patented technology.

Keywords: Aggregation, Citation, EU, Evaluation, Indicator, Indicators, Japan, Litigation, Patent, Research, Techniques, Technology, United States, Utility

? Nauwelaers, C. and Reid, A. (1995), Methodologies for the evaluation of regional innovation potential. *Scientometrics*, **34** (3), 497-511.

Full Text: [1995\Scientometrics34, 497.pdf](1995/Scientometrics34,%20497.pdf)

Abstract: This contribution is based on a SPRINT-EIMS project involving a ‘horizontal’ inventory and critical analysis of existing studies on the measurement and evaluation of regional technological innovative potential.(1) After the presentation of a conceptual scheme aiming at reflecting on the functioning of a ‘Regional System of Innovation’, the main trends in methodological approaches to the evaluation of regional innovative potential in the European Union are discussed, pointing to the necessity of moving progressively towards a methodology taking into account interactions, both locally and externally, between the various components and actors of the innovation process. There is no single best-practice methodology in this respect: the use of an ‘eclectic’ assortment of methodological approaches is investigated and the recommendation given to develop data bases on innovation at regional level.

Keywords: Analysis, European Union, Evaluation, Innovation, Measurement, Methodology, Potential, Trends

? OHerlihy, J. (1995), RT&D, regional development and evaluation. *Scientometrics*, **34** (3), 513-518

Full Text: [1995\Scientometrics34, 513.pdf](1995/Scientometrics34,%20513.pdf)

Keywords: Development, Evaluation

? Rinaldini, C. (1995), Experience on research evaluation at the Joint Research Centre of the European Commission. *Scientometrics*, **34** (3), 519-525.

Full Text: [1995\Scientometrics34, 519.pdf](1995/Scientometrics34,%20519.pdf)

Abstract: Since more than 10 years, the obligation to perform a research evaluation about the JRC activities is included in Council decisions on research programmes. From 1984 to 1986 eight Peer Panels reviews were performed, one for each programme, and they were followed by an overall assessment by the JRC Scientific Council. For the research programme 1988-1991, a mid-term and a final evaluations were entrusted to expert Panels for the all JRC. For the last programme, 1992-1994, a new approach was introduced by charging Visiting Groups to perform an evaluation of each JRC Institute. Internal evaluation through questionnaires and bibliometric analyses were also attempted at JRC. The merits of the various approaches are highlighted and specific considerations are shortly discussed concerning the ‘control’ and the ‘support’ function of the evaluations, quantitative and qualitative assessments, distributed or centralised evaluations, single or multi-stage evaluations.

Keywords: Assessment, Bibliometric, Evaluation, Function, Obligation, Qualitative, Questionnaires, Research, Research Evaluation

Smith, W.A. (1995), Evaluating research, technology and development in Canadian industry: Meeting the challenges of industrial innovation. *Scientometrics*, **34** (3), 527-539.

Full Text: [1995\Scientometrics34, 527.pdf](1995/Scientometrics34,%20527.pdf)

Abstract: Canadian firms respond to the challenges and opportunities of global competition by increasing their research productivity and the rate of innovation. The competitive edge for Canadian industry must now be based on a new appreciation of the dynamics of R & D, as well as management practices and strategies which are relevant to the systems which underpin innovation. New R & D and management models are being adopted by firms to cope with the dynamic and complex nature of innovation, the growing importance of transactions and linkages within innovation systems and the range of financial, human, social and environmental factors which now impact on technology assessment and decision-making. Given this new paradigm, evaluation techniques are being created and adopted by Canadian industry which provide them with a greater understanding of the value of their research and enhance the agility of their technology management. But, these developments are not confined to industry. of equal importance is the convergence of evaluation methods used in both industry and governments to assess research and technology. The methods used by industry are now the techniques employed by governments to assess their own R & D and to formulate industrial S & T policies and strategies.

Keywords: Assessment, Competition, Decision Making, Decision-Making, Development, Dynamics, Environmental, Evaluation, Human, Innovation, Management, Methods, Models, Paradigm, Research, Research Productivity, Techniques, Technology, Technology Assessment, Technology Management, Understanding

? Hodges, S., Hodges, B., Meadows, A.J., Beaulieu, M. and Law, D. (1996), The use of an algorithmic approach for the assessment of research quality. *Scientometrics*, **35** (1), 3-13.

Full Text: [1996\Scientometrics35, 3.pdf](1996/Scientometrics35,%203.pdf)

Abstract: Recent years have seen a growing interest in the use of quantitative parameters for assessing the quality of research carried out at universities. In the UK, university departments are now subject to regular investigations of their research standing. As part of these investigations, a considerable amount of quantitative (as well as qualitative) information is collected from each department. This is made available to the panels appointed to assess research quality in each subject area. One question that has been raised is whether the data can be combined in some way to provide an index which can help guide the panels’ deliberations. This question is looked at here via a detailed examination of the returns from four universities for the most recent (1992) research assessment exercise. The results suggest that attempts to derive an algorithm are only likely to be helpful for a limited range of subjects.

Melin, G. (1996), The networking university: A study of a Swedish university using institutional co-authorships as an indicator. *Scientometrics*, **35** (1), 15-31.

Full Text: [1996\Scientometrics35, 15.pdf](1996/Scientometrics35,%2015.pdf)

Abstract: This article examines the subject of research collaboration, and elaborates on this subject on an institutional rather than an individual level. An empirical case-study is presented, the research collaboration of Umeå University in Sweden, during the period 1991-1993 is investigated. Institutional co-authorships based on the addresses of the departments are used as an indicator of this collaboration. The results are separated into three levels: the local level, the national level, and the international level. It is obvious that the research collaboration is most extensive. Finally the university’s collaboration is discussed and a scheme is proposed with the purpose to understand research collaboration in a social as well as a cognitive context. The guiding terms here are access, visibility and attractiveness.

? Leta, J. and De Meis, L. (1996), A profile of science in Brazil. *Scientometrics*, **35** (1), 33-44.

Full Text: [1996\Scientometrics35, 33.pdf](1996/Scientometrics35,%2033.pdf)

Abstract: The Brazilian contribution to publications in science and humanities increased from 0.29% of the worldwide total in 1981 to 0.46% in 1993. In science, but not in humanities, Brazilian publications tend to follow the world publication trend, thus, during the period 1981-1993, 57.9% of Brazilian publications were in life sciences, 35.4% in exact sciences, 3.9% in earth sciences and 2.9% in humanities. The ten institutions with the largest number of publications are universities, which account for half of the all Brazilian publications. The total number of authors on the Brazilian 1981-1993 publications was 52,808. Among these 57.8% appear in only one publication and 17.5% have their publications cited more than 10 times.

Keywords: Biochemists

Davis, G. and Royle, P. (1996), A comparison of Australian university output using journal impact factors. *Scientometrics*, **35** (1), 45-58.

Full Text: [1996\Scientometrics35, 45.pdf](1996/Scientometrics35,%2045.pdf)

Abstract: We weighted the output of SCI items from Australian universities using journal impact factors. This provides us with an accessible quality indicator of science journal publishing, and allow us to scale for institutional size in terms of output and research staff. Use of this indicator for the 20 pre-1987 Australian universities demonstrates that although some universities rank highly on output, when scaled for institutional size they are overtaken by some of the smaller, more recently established universities.

Rodríguez, K. and Moreiro, J.A. (1996), The growth and development of research in the field of ecology as measured by dissertation title analysis. *Scientometrics*, **35** (1), 59-70.

Full Text: [1996\Scientometrics35, 59.pdf](1996/Scientometrics35,%2059.pdf)

Abstract: This study assesses the growth, the patterns of development and the complexity of research in the field of ecology from 1976 to 1993 in Spain and the five Spanish speaking countries of the Caribbean. Using as a yardstick of research and development in that field, the dissertation titles were counted for each region. The total length, the key words per title were recorded and analysed statistically. Results show that the growth of research in ecology is greater in Spain and peaked earlier than in the Caribbean countries. However, the titles in the latter region were more complex than those in Spain.

? Urban, D. (1996), Quantitative measurement of public opinions on new technologies - An application of SEM-methodology to the analysis of beliefs and values toward new human applications of genetic engineering. *Scientometrics*, **35** (1), 71-92.

Full Text: [1996\Scientometrics35, 71.pdf](1996/Scientometrics35,%2071.pdf)

Abstract: The article presents the methodology of structural equation modeling (SEM) to study social perceptions of new technologies. It argues that the SEM-methodology offers a better statistical approach for the analysis of technology-related attitudes than the techniques most often applied in the field of public opinion research. SEM eliminates, compensates for, or at least reduces many problems raised by common surveying practices researching attitudes on new technologies. In particular, SEM-methodology reduces difficulties of testing the validity and reliability of measuring instruments when those are applied to vague and weakly established opinions on new technologies. To demonstrate these advantages of SEM the research presented here concentrates on the cognitive formation of public attitudes toward the particular gene technologies of prenatal genetic testing (pGT) and prenatal genetic engineering (pGE). The study explores whether a statistical analysis of various opinions on these technologies can reveal a set of underlying, structured attitudes, and if so, whether these attitudes form an entire syndrome or are differentiated into several distinct, coherent complexes.

Magri, M.H. and Solari, A. (1996), The SCI journal citation reports: A potential tool for studying journals? I. Description of the JCR journal population based on the number of citations received, number of source items, impact factor, immediacy index and cited half-life. *Scientometrics*, **35** (1), 93-117.

Full Text: [1996\Scientometrics35, 93.pdf](1996/Scientometrics35,%2093.pdf)

Abstract: In this paper, we analysed six indicators of the SCI Journal Citation Reports (JCR) over a 19-year period: number of total citations, number of citations to the two previous years, number of source items, impact factor, immediacy index and cited half-life. The JCR seems to have become more or less an authority for evaluating scientific and technical journals, essentially through its impact factor. However it is difficult to find one’s way about in the impressive mass of quantitative data that JCR provides each year. We proposed the box plot method to aggregate the values of each indicator so as to obtain, at a glance, portrayals of the JCR population from 1974 to 1993. These images reflected the distribution of the journals into 4 groups designated low, central, high and extreme. The limits of the groups became a reference system with which, for example, it was rapidly possible to situate visually a given journal within the overall JCR population. Moreover, the box plot method, which gives a zoom effect, made it possible to visualize a large sub-population of the JCR usually overshadowed by the journals at the top of the rankings. These top level journals implicitly play the role of reference in evaluation processes. This often incites categorical judgements when the journals to be evaluated are not part of the top level. Our ‘rereading’ of the JCR, which presented the JCR product differently, made it possible to qualify these judgements and bring a new light on journals.

Schwartz, S. and Hellin, J.L. (1996), Measuring the impact of scientific publications. The case of the biomedical sciences. *Scientometrics*, **35** (1), 119-132.

Full Text: [1996\Scientometrics35, 119.pdf](1996/Scientometrics35,%20119.pdf)

Abstract: The bibliometric indicators currently used to assess scientific production have a serious flaw: a notable bias is produced when different subfields are compared. In this paper we demonstrate the existence of this bias using the impact factor (IF) indicator. The impact factor is related to the quality of a published article, but only when each specific subfield is taken separately: only 15.6% of the subfields we studied were found to have homogeneous means. The bias involved can be very misleading when bibliometric estimators are used as a basis for assigning research funds. To improve this situation, we propose a new estimator, the RPU, based on a normalization of the impact factor that minimizes bias and permits comparison among subfields. The RPU of a journal is calculated with the formula: RPU = 10(1-exp (-IF/x)), where IF is the impact factor of the journal and x the mean IF for the subfield in which the journal belongs. The RPU retains the advantages of the impact factor: simplicity of calculation, immediacy and objectivity, and increases homogeneous subfields from 15.6% to 93.7%.

Katz, J.S. and Hicks, D.M. (1996), A systemic view of British science. *Scientometrics*, **35** (1), 133-154.

Full Text: [1996\Scientometrics35, 133.pdf](1996/Scientometrics35,%20133.pdf)

Abstract: Systemic analyses of national research systems are now within the reach of bibliometricians. By systemic we mean comprehensive, time series, institutionally based, sectoral level analyses of national research output. This paper describes such an analysis for the UK, a system comprising 8% of world scientific output. The paper analyses publishing size and the number of publishing institutions for each sector. Then each sector’s intra-sectoral, inter-sectoral and international collaboration is assessed. The paper then examines the data by field, looking at sector publishing profiles across fields, and at how the collaborative patterns vary between fields. It concludes with a summary profile of each institutional sector.

Keywords: Collaboration, Publishing, Research, Science

Schubert, A. (1996), Acientometrics: A citation based bibliography, 1990. *Scientometrics*, **35** (1), 155-163.

Full Text: [1996\Scientometrics35, 155.pdf](1996/Scientometrics35,%20155.pdf)

? Merton, R.K. (1996), Untitled. *Scientometrics*, **35** (2), U3.

Full Text: Scientometrics35, U3.pdf

? Glänzel, W., Katz, S., Moed, H. and Schoepflin, U. (1996), Proceedings of the Workshop on ‘Bibliometric Standards’ Rosary College, River Forest, Illinois (USA) Sunday, June 11, 1995. *Scientometrics*, **35** (2), 165-166.

Full Text: [1996\Scientometrics35, 165.pdf](1996/Scientometrics35,%20165.pdf)

Keywords: Illinois, USA

Glänzel, W. (1996), The need for standards in bibliometric research and technology. *Scientometrics*, **35** (2), 167-176.

Full Text: [1996\Scientometrics35, 167.pdf](1996/Scientometrics35,%20167.pdf)

Abstract: The need for standardisation in bibliometric research and technology is discussed in the context of failing communication within the scientific community, the unsatisfactory impact of bibliometric research outside the community and the observed incompatibility of bibliometric indicators produced by different institutes. The development of bibliometric standards is necessary to improve the reliability of bibliometric results, to guarantee the validity of bibliometric methods and to make bibliometric data compatible. Both conceptual and technical questions are raised. Consequences of lacking standards are illustrated by typical examples. Finally, particular topics of standardisation are proposed based on experiences made at ISSRU.

Keywords: Bibliometric, Bibliometric Indicators, Bibliometric Methods, Bibliometric Research, Communication, Community, Development, Indicators, Methods, Reliability, Research, Standards, Technology, Validity

Moed, H.F. (1996), Differences in the construction of SCI based bibliometric indicators among various producers: A first overview. *Scientometrics*, **35** (2), 177-191.

Full Text: [1996\Scientometrics35, 177.pdf](1996/Scientometrics35,%20177.pdf)

Abstract: This contribution discusses basic technical-methodological issues with respect to data collection and the construction of bibliometric indicators, particularly at the macro or meso level. It focusses on the use of the Science Citation Index. Its aim is to highlight important decisions that have to be made in the process of data collection and the construction of bibliometric indicators. It illustrates differences in the methodologies applied by several important producers of bibliometric indicators: the Institute for Scientific Information (ISI), CHI Research, Inc. the Information Science and Scientometrics Research Unit (ISSRU) at Budapest, and the Centre for Science and Technology Studies at Leiden University (CWTS). The observations made in this paper illustrate the complexity of the process of ‘standardisation’ of bibliometric indicators. Moreover, they provide possible explanations for divergence of results obtained in different studies. The paper concludes with a few general comments related to the need of ‘standardisation’ in the field of bibliometrics.

Keywords: Basic Research, Bibliometric, Bibliometric Indicators, Bibliometrics, Citation, Complexity, First, Indicators, Institute for Scientific Information, ISI, SCI, Science Citation Index, Scientometrics

Katz, J.S. (1996), Bibliometric standards: Personal experience and lessons learned. *Scientometrics*, **35** (2), 193-197.

Full Text: [1996\Scientometrics35, 193.pdf](1996/Scientometrics35,%20193.pdf)

Abstract: Bibliometric standards are essential for comparative research. However, these standards can not be set by committee but must evolve through an on-going debate. Perhaps, the Scientometric community needs a refereed forum more dedicated to methodological issues than policy matters in which the standards debate can proceed in a focused and professional manner.

Keywords: Community, Needs, Policy, Research, Standards

Bourke, P. and Butler, L. (1996), Standards issues in a national bibliometric database: The Australian case. *Scientometrics*, **35** (2), 199-207.

Full Text: [1996\Scientometrics35, 199.pdf](1996/Scientometrics35,%20199.pdf)

Abstract: In recent years researchers in the Performance Indicators Project at the Australian National University have undertaken a number of projects involving collaboration with colleagues in England or attempts to replicate results obtained by others. All projects have necessitated close scrutiny of the methodologies previously used or to be used and have made clear the urgent need for comparable standards. In this paper we have focused on two projects: one, an analysis of Australia’s shares of publications and citations, where we sought to learn from the debate on methodology that surrounded the question of decline in British science, the second, an analysis of astronomy publications in Australia where we sought to replicate methodology used in a previous European study.

Keywords: Analysis, Australia, Bibliometric, Citations, Collaboration, Database, England, Methodology, Publications, Science, Standards

Zitt, M. and Teixeira, N. (1996), Science macro-indicators: Some aspects of OST experience. *Scientometrics*, **35** (2), 209-222.

Full Text: [1996\Scientometrics35, 209.pdf](1996/Scientometrics35,%20209.pdf)

Abstract: We report OST experience on macro-indicators producing, especially on academic science and ISI sources. This task requires a combination of organizational choices for data handling and processing, and of bibliometric choices for a selection of indicators appropriate to the missions. Both aspects are briefly studied: the OST database, which also contains non-bibliometric datasets, is organized on the relational principle (RDBMS). Bibliometric indicators selected are classical ones, with a stress on overall coherence. In conclusion, standardization issue is briefly discussed. Standardization may not be desirable at the same extent for different targets (data, nomenclatures, indicators, procedures, etc.) and must not hinder further research. Natural process of communication and explicitation may also lead to fruitful convergences, without freezing supposed ‘best ways’.

Keywords: Bibliometric, Bibliometric Assessment, Communication, Database, Indicators, ISI, Journals, Lead, Procedures, Research, Science, Set, Stress, UK Scientific Performance

? Gomez, I., Bordons, M., Fernandez, M.T. and Mendez, A. (1996), Coping with the problem of subject classification diversity. *Scientometrics*, **35** (2), 223-235.

Full Text: [1996\Scientometrics35, 223.pdf](1996/Scientometrics35,%20223.pdf)

Abstract: The delimitation of a research field in bibliometric studies presents the problem of the diversity of subject classifications used in the sources of input and output data. Classification of documents according to thematic codes or keywords is the most accurate method, mainly used in specialised bibliographic or patent databases. Classification of journals in disciplines presents lower specificity, and some shortcomings as the change over time of both journals and disciplines and the increasing interdisciplinarity of research. Differences in the criteria in which input and output data classifications are based obliges to aggregate data in order to match them. Standardization of subject classifications emerges as an important point in bibliometric studies in order to allow international comparisons, although flexibility is needed to meet the needs of local studies.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Studies, Classification, Criteria, Flexibility, Interdisciplinarity, International, ISI, Journals, Needs, Patent, Publications, Research, SCI 1984-89, Spanish Pharmacologists

? Vinkler, P. (1996), Some practical aspects of the standardization of scientometric indicators. *Scientometrics*, **35** (2), 237-245.

Full Text: [1996\Scientometrics35, 237.pdf](1996/Scientometrics35,%20237.pdf)

Abstract: In the present stage of Scientometrics indicators published are mostly incomparable, which fact impedes the development of the field and makes the users of scientometric results mistrustful. Consequently, standardization of data, methods, indicators and their presentation is urgently needed. For instance, the time periods applied should be standardized across fields and subfields in calculating citation and publication indicators.

Keywords: Citation, Development, Indicators, Methods, Publication, Scientometric, Scientometrics

Arvanitis, R., Russell, J.M. and Rosas, A.Ma. (1996), Experiences with the national citation reports database for measuring national performance: The case of Mexico. *Scientometrics*, **35** (2), 247-255.

Full Text: [1996\Scientometrics35, 247.pdf](1996/Scientometrics35,%20247.pdf)

Abstract: The National Citation Report (NCR) is an integrated citation file supplied by the Institute for Scientific Information (ISI), of an individual country’s articles in science and social sciences. Our experience with the NCR database for Mexico suggests that this is an important addition to the tools available for carrying out bibliometric analysis of research performance. However, in order to generate reliable and accurate indicators using these datafiles we recommend that these be handled by specialists well acquainted with the ISI information products and with the scientific setup of the country concerned.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Citation, Database, Indicators, Information, Institute for Scientific Information, ISI, Mexico, Research, Research Performance, Science, Sciences, Social Sciences

? McGrath, W.E. (1996), The unit of analysis (objects of study) in bibliometrics and scientometrics. *Scientometrics*, **35** (2), 257-264.

Full Text: [1996\Scientometrics35, 257.pdf](1996/Scientometrics35,%20257.pdf)

Abstract: Slow development of bibliometric theory may be due in part to neglect of the unit of analysis - the objects described by variables and about which inferences are made. Problems include: inferences are often made on units other than those sampled, leading to inappropriate conclusions, units in literature reviews and meta-analysis are often not comparable, thus hindering cumulation of knowledge, confusion when names of sampling units in one study might also be the names of variables in other studies - e.g., no. of citations (variable) to papers (sampling unit) and no. of papers (variable) in journals (sampling unit), loss of information about the unit of analysis, means and variances when data are aggregated. If theory is to advance, scientometrics needs a generic definition of the unit of analysis, a complete list of all known units - classified and structured, meta-analyses, reporting standards - especially when data are aggregated, clear indications of data level (nominal, ordinal, interval, ratio), conventions for including units in titles, abstracts and keyword or subject indexes.

Keywords: Analysis, Bibliometric, Bibliometrics, Citations, Development, Indications, Information, Journals, Knowledge, Literature, Meta-Analysis, Needs, Neglect, Papers, Reporting, Scientometrics, Standards, Theory

Rao, I.K.R. (1996), Methodological and conceptual questions of bibliometric standards. *Scientometrics*, **35** (2), 265-270.

Full Text: [1996\Scientometrics35, 265.pdf](1996/Scientometrics35,%20265.pdf)

Abstract: Bibliometric studies are mostly empirical nature and they are mostly centred arround presentation of facts and data. There are very few studies which are centred arround theoretical foundation. The facts are gathered either through surveys or from published bibliographies, indexes, data bases. Based on these facts, empirical models and principles are being developed. The normative principles and standards have to evolve from the logical analyses of the empirical models. The stage is set to integrate empirical models of bibliometrics into standards. Future, bibliometric studies have to address this issue and reach the stage of normative principles.

Keywords: Bibliographies, Bibliometric, Bibliometric Studies, Bibliometrics, Models, Principles, Standards

Lazarev, V.S. (1996), On Chaos in bibliometric terminology. *Scientometrics*, **35** (2), 271-277.

Full Text: [1996\Scientometrics35, 271.pdf](1996/Scientometrics35,%20271.pdf)

Abstract: On behalf of a case study of articles on bibliometric selection and ranking the variance in terminology of the properties of journals is shown: the same properties are called in various manners, while one and the same terms have different meanings. Similar inconsistencies are found in the terms denoting readers’ activities which are studied in bibliometrics for the assessment of the use of periodicals. The author concludes that there are actually only two properties of periodicals that are quantitatively assessed, viz. ‘productivity’ and ‘value’. Their definitions are suggested for terminology standardization of general properties of journals and of readers’ activities.

Keywords: Assessment, Bibliometric, Bibliometrics, Case Study, Chaos, Journals, Periodicals, Ranking, Terminology

? Aguillo, I.F. (1996), Increasing the between-year stability of the impact factor in the science citation index. *Scientometrics*, **35** (2), 279-282.

Full Text: [1996\Scientometrics35, 279.pdf](1996/Scientometrics35,%20279.pdf)

Abstract: The critical evaluation of scientific productivity during last years has been done with the help of the Journal Citation Reports ranks of journals. The relative performance of each journal was derived from a simple calculation called Impact Factor. Such measure has been widely criticized by scientometricians, but alternative proposals were never adopted due perhaps to their complexity, but also to economic limitations. For the informetric purposes this situation has led to a worrying lack of standardization and, worst of all, makes useless many studies for comparative purposes. In order to enhance the comparative value of the impact factor we develop a new easy method that increases the time period used for its calculation. Such new index has advantages over the old one.

Keywords: Alternative, Citation, Complexity, Evaluation, Impact Factor, Journal, Journal Citation Reports, Journals, Science, Science Citation Index, Stability

? Marshakova Shaikevich, I. (1996), The standard impact factor as an evaluation tool of science fields and scientific journals. *Scientometrics*, **35** (2), 283-290.

Full Text: [1996\Scientometrics35, 283.pdf](1996/Scientometrics35,%20283.pdf)

Abstract: The standard impact factor for particular fields of science (Ig) and the relative impact factor K for scientific journals are introduced. The technique of calculation of standard impact factor (Ig) for a field is an inherent part of a method which allows a cross-field evaluation of scientific journals. This method for evaluating scientific journals elaborated in 1988 was aimed at the analysis of Russian journals covered by the SCI database, it was also used for chemical journals (more that 300) and for journals in the Life sciences (more than 1000). The results are discussed.

Keywords: Analysis, Database, Evaluation, Impact Factor, Journals, SCI, Science, Sciences, Scientific Journals, Standard, The SCI Database

Glänzel, W. (1996), A bibliometric approach to social sciences. National research performances in 6 selected social science areas, 1990-1992. *Scientometrics*, **35** (3), 291-307.

Full Text: [1996\Scientometrics35, 291.pdf](1996/Scientometrics35,%20291.pdf)

Abstract: The Brazilian scientific production and its international impact increased considerably in the last 10 years. This increase occurred in spite of a reduction in the resources for science in the same period. The data show that the explanation for this apparent paradox lies in the active process of international and national collaboration which increased in this same period. Collaborative work was supported by several programs of the Brazilian agencies. Advantages and possible drawbacks of the intensification of scientific collaboration for the Brazilian science are discussed.

? Nieminen, P. (1996), Type of empirical research reports, as an explanatory factor in citation performance of psychiatric research. *Scientometrics*, **35** (3), 309-320.

Full Text: [1996\Scientometrics35, 309.pdf](1996/Scientometrics35,%20309.pdf)

Abstract: In all fields of human sciences there has long been a debate whether research of these fields should closely follow the traditional method with accurate measurements and statistical inference. More qualitative approaches have been proposed, by which is ment that the research aim is to use the data in their qualitative form. The purpose of this study was to describe the differences in citations between qualitative and quantitative empirical reports. A total of 262 published reports of research pertaining to the therapeutic community and psychiatric wards in a variety of treatment settings from 1987 to 1992 were analyzed. The main finding of this study was that quantitative reports were mon frequently cited than qualitative ones - also when some confounding factors were controlled.

Keywords: Citation, Citations, Confounding, Differences, Human, Qualitative, Qualitative Approaches, Quantitative, Research, Sciences, Statistical, Traditional, Treatment

? Berg, J. and Wagner-Döbler, R. (1996), A multidimensional analysis of scientific dynamics. Part I. Case studies of mathematical logic in the 20th century. *Scientometrics*, **35** (3), 321-346.

Full Text: [1996\Scientometrics35, 321.pdf](1996/Scientometrics35,%20321.pdf)

Abstract: Sequences of empirical Lotka-like distributions of the publications of scientific areas are mapped into a multidimensional parameter space. On this basis a new definition of the notion of an epidemic phase of a discipline is introduced. A graphic representation of the parameter space along with results of an exponential regression analysis of the Lotka exponent yield an image of the inner state of a discipline and renders possible a prognosis. Examples, primarily from mathematical logic, are described in detail. The notion of a scientific elite is discussed and the hypotheses of Ortega, Merton, and Price are critically assessed.

Keywords: Analysis, Law, Prognosis, Publications, Regression Analysis

? Breimer, L.H. and Breimer, D.D. (1996), The CED Le DEC: Common European doctorate, or doctorate Europeen commune or dissertations on the Internet. *Scientometrics*, **35** (3), 347-353.

Full Text: [1996\Scientometrics35, 347.pdf](1996/Scientometrics35,%20347.pdf)

Abstract: An international electronic thesis system is proposed to provide ready access to doctoral dissertations and ensure uniform standards. To establish common criteria, the publication-based Dutch doctoral degree system was assessed and compared with studies of other national systems. Current Dutch doctoral theses in biomedical fields were of a high standard. 93% of theses were based on published work. The median number of papers per thesis was four, with five authors per paper. The candidate was the key author on 84%. Representative journals of publication ranked in the top quartile of the Science Citation Index with a median rank of 241.

Keywords: Author, Authors, Biomedical, Citation, Dissertations, Doctoral Theses, Internet, Journals, Papers, Publication, Science, Science Citation Index, Standards, Thesis, Universities

? Seglen, P.O. (1996), Quantification of scientific article contents. *Scientometrics*, **35** (3), 355-366.

Full Text: [1996\Scientometrics35, 355.pdf](1996/Scientometrics35,%20355.pdf)

Abstract: The information contents of 143 biomedical journal articles were quantified by standardized criteria, emphasizing quantitative measurements and estimated labour investments. A hundredfold variability in article information contents was uncovered, producing a Poisson distribution with a median (peak) value at about one-half of the sample mean. Two-thirds of the articles thus had information contents below the average scientific article, testifying to the somewhat excessive fragmentation of the primary scientific literature: The information contents of an article depended on three different factors: (1) the number of pages, which rarely exceeded an upper limit corresponding to the standard article format (7-8 pages), (2) the number of figures plus tables per page, which similarly reached saturation at the standard format value (one per page), (3) the density of information packaging within each figure and table, for which no upper limit was observed. The latter factor could, therefore, account for virtually all information contents in excess of the standard article format. Differences in the information density of figures and tables were apparently not perceived by a peer reviewer, who tended to overestimate low-contents articles and underestimate high-contents articles. Furthermore, a model evaluation of the article authors indicated that evaluation by contents quantification and by straight article counting might give different results. Since neither peer review nor publication counts could satisfactorily detect differences in the information contents of scientific articles, objective contents quantification would seem to be required for an exact and fair evaluation of scientific productivity.

Keywords: Biomedical, Criteria, Evaluation, Information, Journal, Journal Articles, Less, Literature, Model, Packaging, Peer Review, Peer-Review, Primary, Publication, Publication Counts, Quality, Review, Saturation, Standard, Variability

Meneghini, R. (1996), The key role of collaborative work in the growth of Brazilian science in the last ten years. *Scientometrics*, **35** (3), 367-373.

Full Text: [1996\Scientometrics35, 367.pdf](1996/Scientometrics35,%20367.pdf)

Abstract: The Brazilian scientific production and its international impact increased considerably in the last 10 years. This increase occurred in spite of a reduction in the resources for science in the same period. The data show that the explanation for this apparent paradox lies in the active process of international and national collaboration which increased in this same period. Collaborative work was supported by several programs of the Brazilian agencies. Advantages and possible drawbacks of the intensification of scientific collaboration for the Brazilian science are discussed.

Keywords: Collaboration, Explanation, Growth, International, Reduction, Science, Scientific Collaboration, Scientific Production, Work

Vinkler, P. (1996), Relationships between the rate of scientific development and citations. The chance for citedness model. *Scientometrics*, **35** (3), 375-386.

Full Text: [1996\Scientometrics35, 375.pdf](1996/Scientometrics35,%20375.pdf)

Abstract: Chances for information to be cited (CC) depend on disciplines and topics because of different publication and referencing practices. However, the developmental rate of knowledge strongly influences CC as well. By a simple model it has been concluded that CC are the greater the faster the publication rate.

Keywords: Citations, Development, Information, Knowledge, Model, Publication, Referencing, Subfields

Winclawska, B.M. (1996), Polish sociology citation index (principles for creation and the first results). *Scientometrics*, **35** (3), 387-391.

Full Text: [1996\Scientometrics35, 387.pdf](1996/Scientometrics35,%20387.pdf)

Abstract: The author discusses inefficiencies of Garfield’s *Social Sciences Citation Index* to measure quality of a discipline in a national context. She proposes an alternative measurement tool to the Garfield’s index. The example of sociology was selected, an index of Polish sociology was created and data from it was compared with data retrieved from the SSCI. The two sets were compared to show greater ‘sensitivity’ of the locally created index.

Keywords: Alternative, Citation, Context, Data, First, Index, Measure, Measurement, Principles, Quality, Quality of, Sociology, SSCI

? Schubert, A. (1996), Scientometrics: A citation based bibliography, 1991. *Scientometrics*, **35** (3), 393-399

Full Text: [1996\Scientometrics35, 393.pdf](1996/Scientometrics35,%20393.pdf)

Keywords: Citation, Scientometrics

? Liang, L.M., Zhao, H.Z., Wang, Y. and Wu, Y.S. (1996), Distribution of major scientific and technological achievements in terms of age group - Weibull distribution. *Scientometrics*, **36** (1), 3-18.

Full Text: [1996\Scientometrics36, 3.pdf](1996/Scientometrics36,%203.pdf)

Abstract: A statistical analysis is made of two data sets and it is found that the distribution of major scientific and technological achievements in terms of the age of those achievement makers is Weibull distribution. Pearson’s chi(2) test results are satisfactory. This finding holds for different centuries, different nations and different disciplines.

Keywords: Achievement, Analysis, Statistical

? Gupta, B.M. and Karisiddappa, C.R. (1996), Author productivity patterns in theoretical population genetics (1900-1980). *Scientometrics*, **36** (1), 19-41.

Full Text: [1996\Scientometrics36, 19.pdf](1996/Scientometrics36,%2019.pdf)

Abstract: Focuses on the validity of Lotka’s law and the negative binomial distribution model to author productivity data in different time periods in theoretical population genetics speciality. Finds out if there is any relation between applicability of a statistical distribution and the development of speciality. Looks at the linkages between inequality/concentration measures and the development of speciality. Explores the relevance and applicability of the two generalisations, namely Price Square Root Law and 80/20 Rule to the author productivity data and their relation with development of theoretical population genetics. Finally, a study of the growth of practitioners in the field with different productivity levels is conducted, and the emergence of core authors in the speciality is explored.

Keywords: Author, Authors, Development, Distributions, Genetics, Growth, Law, Lotka’s Law, Lotkas Law, Model, Nigeria, Population Genetics, Productivity, Productivity Patterns, Science, Statistical, Statistical Distribution, Validity Dickenson, R.P. (1996), The level of research in advanced composite materials in the countries of the former Soviet Union. *Scientometrics*, **36** (1), 43-57.

Full Text: [1996\Scientometrics36, 43.pdf](1996/Scientometrics36,%2043.pdf)

Abstract: The advanced materials studied were those composites based on ceramic, boron, carbon and aramid fibres. Research level was quantified by a bibliometric analysis of publications, including a study of citations, an analysis of patents, a professional assessment of Soviet work by reviewing the open literature and by discussing with scientists and engineers in the former Soviet Union. The conclusion drawn was that the level of research in the former USSR did not match that in the West. There were, however, several niche areas were the level of research was comparable or in advance of the West, notably aramid fibres.

Keywords: Bibliometric, Bibliometric Analysis, Citations, Literature, Patents, Research, Science

Godin, B. and Ippersiel, M.P. (1996), Scientific collaboration at the regional level: The case of a small country. *Scientometrics*, **36** (1), 59-68.

Full Text: [1996\Scientometrics36, 59.pdf](1996/Scientometrics36,%2059.pdf)

Abstract: Despite the various studies on international collaboration, we still know very little about other forms of scientific collaboration. The present paper looks at collaboration at a national level, more particularly between regions in a country. It is found that regional collaboration is very limited. In fact, international collaboration is three times more important than regional collaboration. This can be explained by the fact that the competition center in science is international rather than national.

? Kundra, R. (1996), Investigation of collaborative research trends in Indian medical sciences: 1900-1945. *Scientometrics*, **36** (1), 69-80.

Full Text: [1996\Scientometrics36, 69.pdf](1996/Scientometrics36,%2069.pdf)

Abstract: The decade beginning 1925 is important in the history of medical science in modern India. This is evident from the bibliometric study of the publications in the Indian Medical Gazette, from 1900 to 1945. The paper studies the evolution of collaboration in the field of medical sciences during this period. In order to do so the study determines the: (i) pattern of collaboration in basic and applied research in medical science; (ii) trends in the multiplicity of authors; and (iii) the type of collaboration for the period 1900-1945. The collaborative and authorship trends discussed in the paper suggests that medical science was still in the developing stage in India in the period 1900-1945, and there was a possibility of its expansion in the near future.

Keywords: Authors, Authorship, Bibliometric, Bibliometric Study, Collaboration, Evolution, History, India, Medical, Publications, Research, Research Trends, Science, Sciences, Scientific Co-Authorship, Trends

? Jiménez-Contreras, E. and FerreiroAláez, L. (1996), Publishing abroad: Fair trade or short sell for non-English-speaking authors? A Spanish study. *Scientometrics*, **36** (1), 81-95.

Full Text: [1996\Scientometrics36, 81.pdf](1996/Scientometrics36,%2081.pdf)

Abstract: We investigated the integration into the international scientific literature of articles published by researchers at the University of Granada (Spain) between 1976 and 1987, in journals published outside of Spain. The Science Citation Index was used to measure integration, and the articles were classified for comparison into eight fields (clinical medicine, experimental medicine, geology, chemistry, physics, biology, pharmaceutical science and mathematics). The minimum criterion for integration was considered fulfilled when the size of the two communities of citing authors considered (Spanish and non-Spanish) was equal, i.e., when the absolute number of citations in both communities was equal. On the basis of this criterion, articles in clinical medicine and experimental medicine were found to be integrated into the international literature. The regression lines for the number of citations per year in each field in the two communities of citing authors were parallel, indicating that integration of Spanish publications in these two fields was stationary. Of the fields found not to be integrated, the lines for pharmaceutical science citations in the two communities indicated little sign of future change in the proportion of Spanish to non-Spanish citations. Citations in the remaining five fields indicated a steady decrease in integration. We introduce the concept of the “drag effect” of national citations on citation indices in the international literature: a sharp increase in the number of Spanish articles published in non-Spanish journals may exceed the capacity of the international community to “absorb”, understand and cite these new publications.

Keywords: Articles, Authors, Biology, Capacity, Citation, Citation Indices, Citations, Clinical Medicine, Experimental, Integration, Journals, Literature, Medicine, Publications, Publishing, Researchers, Science, Science Citation Index, Scientific Literature, Spain, University

? Egghe, L. and Rousseau, R. (1996), Average and global impact of a set of journals. *Scientometrics*, **36** (1), 97-107.

Full Text: [1996\Scientometrics36, 97.pdf](1996/Scientometrics36,%2097.pdf)

Abstract: In this note we clarify some notions concerning citations, publications, and their quotients: impact and indifference (a measure of invisibility, introduced in this article). In particular, we show that the slope of the regression line of the impact as a function of the number of publications is positive if and only if the global impact, i.e. the impact of the set of all journals under consideration, is larger than the average impact of all journals.

Keywords: Citations, Impact, Journals, Publications

? Rajeswari, A.R. (1996), Indian patents statistics - An analysis. *Scientometrics*, **36** (1), 109-130.

Full Text: [1996\Scientometrics36, 109.pdf](1996/Scientometrics36,%20109.pdf)

Keywords: Analysis, Statistics

Schubert, A. (1996), Scientometrics: A citation based bibliography, 1992. *Scientometrics*, **36** (1), 131-140.

Full Text: [1996\Scientometrics36, 131.pdf](1996/Scientometrics36,%20131.pdf)

? Gabolde, I. (1996), First international conference on the evaluation of research technology and development - 26, 27 & 28 April 1995, Thessaloniki, Greece - Opening address (vol 34, pg 317, 1995). *Scientometrics*, **36** (1), 143.

Full Text: [1996\Scientometrics36, 143.pdf](1996/Scientometrics36,%20143.pdf)

Keywords: Development, Evaluation, Greece, Research, Technology

? Braun, T. and Schubert, A. (1996), Indicators of research output in the sciences from 5 central European countries, 1990-1994. *Scientometrics*, **36** (2), 145-165.

Full Text: [1996\Scientometrics36, 145.pdf](1996/Scientometrics36,%20145.pdf)

Keywords: Countries, Datafiles, Indicators, Research, Research Output, Sciences

? deLooze, M.A., Coronini, R., Legentil, M., Jeannin, P. and Magri, M.H. (1996), Determining the core of journals of a research centre: The example of researchers from the department of rural economy and sociology of the Institut National de la Recherche Agronomique, France. *Scientometrics*, **36** (2), 167-183.

Full Text: [1996\Scientometrics36, 167.pdf](1996/Scientometrics36,%20167.pdf)

Abstract: This paper analyses the determination of visibility of journals in which researchers of INRA (National Institute for Agricultural Research) publish. The corpus is comprised of 671 articles published over a period of four years in 258 journals. The advantage of the method applied for determining the visibility of journals is that it combines two approaches: a) bibliometric indicators (coverage by the ISI-publications and by two specific French databases) and b) experts’ opinions (10 economists and sociologists). The main results are: a) There is a convergence between the opinion of the experts and visibility, in the databases, b) The impact factor confirms the main opinions of the experts. The first journals ranked by the experts and JCR Social Sciences are the same but represent only 40 per cent of the total journals analysed. The other journals were revealed by the experts and French databases. “Whoever seeks to pass a balanced but lucid judgement on the general trends of the activity carried out by the profession to which he belongs, is liable to say either banalities or to hurt his colleagues”.

Keywords: Articles, Bibliometric, Bibliometric Indicators, Coverage, Databases, France, French, Humanities, Impact, Impact Factor, Indicators, JCR, Journals, Performance, Research, Researchers, Sciences, Social Sciences, Sociologists, Sociology, Trends, Visibility

? Prpic, K. (1996), Characteristics and determinants of eminent scientists’ productivity. *Scientometrics*, **36** (2), 185-206.

Full Text: [1996\Scientometrics36, 185.pdf](1996/Scientometrics36,%20185.pdf)

Abstract: The empirical research on the sample of 385 eminent Croatian scientists was carried out in order to explore the patterns and factors of their scientific productivity. The study design made it possible to compare the results with those obtained in the 1990 survey on a sample of the research population. The average scientific productivity of eminent researchers is not only several times larger but also shows a more intensive scientific collaboration and orientation towards the international scientific arena, The most important predictors of the elite’s productivity are also qualificational and organizational variables but of a more selective nature. By including the eminent scientists’ gatekeeping roles, the explanation of their total, co-authored and foreign publications can be improved.

Keywords: Characteristics, Citation, Collaboration, Cumulative Advantage, Design, Determinants, Dispute, Ortega Hypothesis, Predictors, Productivity, Publication Productivity, Publications, Research, Researchers, Rise, Science, Scientific Collaboration, Scientific Productivity, Stratification, Survey

? Galante, E. and Sala, C. (1996), R&D evaluation at the Italian National Research Council: The agricultural sector. *Scientometrics*, **36** (2), 207-222.

Full Text: [1996\Scientometrics36, 207.pdf](1996/Scientometrics36,%20207.pdf)

Abstract: The principles and methodology of intra-mural and extra-mural research assessment developed at the Italian National Research Council are critically described. Information is given about the organisation of agricultural research system.

Keywords: Assessment, Evaluation, Methodology, R&D, Research

? Vinkler, P. (1996), Model for quantitative selection of relative scientometric impact indicators. *Scientometrics*, **36** (2), 223-236.

Full Text: [1996\Scientometrics36, 223.pdf](1996/Scientometrics36,%20223.pdf)

Abstract: A model experiment is presented for the quantitative selection of relative scientometric impact indicators used in evaluating the scientific impact, of papers. The Relative Subfield Citedness (R(W)) indicator proved to be the most appropriate according to the criteria chosen. R(W) increases with the number of citations to the papers and, in contrast to other relative impact indicators, does not decrease if an author chooses to publish most of his papers in journals with large impact factors or if most of the citations to his papers are to the ones in journals with the largest impact factors.

Keywords: Citations, Citedness, Criteria, Impact, Impact Factors, Indicators, Journals, Model, Publications, Quantitative, Scientific Impact, Selection, Subfields

? Trimble, V. (1996), Productivity and impact of large optical telescopes. *Scientometrics*, **36** (2), 237-246.

Full Text: [1996\Scientometrics36, 237.pdf](1996/Scientometrics36,%20237.pdf)

Abstract: An attempt is made to provide quantitative measures of the amount of data gathered at large optical telescopes throughout the world and the impact these data have on astronomical research. The data base comprises 1163 papers reporting data from 39 telescopes, published between January 1990 and June 1991, and 4052 citations to them in 1993. Productivity measured in papers per square meter of telescope mirror varies by a factor of six, and impact measured in citations per paper varies by a factor of more than 10. Predictably, high productivity and high impact are associated with telescopes located at good sites and fully supported for many years by organizations with large budgets. Low productivity and low impact are associated with less favorable locations, short periods of operation, and financial stringency. In addition, the most productive telescopes seem to be ones whose users include astronomers from a wide range of geographical locations.

Keywords: Citations, Impact, Low, Papers, Productivity, Quantitative, Research, Sites

Braun, T. and Glänzel, W. (1996), International collaboration: Will it be keeping alive East European research? *Scientometrics*, **36** (2), 247-254.

Full Text: [1996\Scientometrics36, 247.pdf](1996/Scientometrics36,%20247.pdf)

Abstract: International scientific collaboration is very sensitive to political and economic changes in a country or a geopolitical region. Collaboration in research is reflected by die corresponding co-authorship of the published results which can be analysed with the help of bibliometric methods. Based on data from the Science Citation Index (SCI), the change of annual international co-authorship patterns of Bulgaria, Czechoslovakia, Hungary, Poland and Romania have been analysed for die periods 1981-1985 and 1984-1993, respectively. It is shown that international collaboration was not developing similarly in the countries under study. Whilst scientific communities of Hungary and Poland have already been opening in the early 80s, the international collaboration of the other East-European countries was still dominated by COMECON relations till 1989. As expected, since 1990 an increasing scientific collaboration with highly developed countries can be observed in all five countries. At the same time, scientific collaboration with the former communist countries shows a clear decline. The great share of international co-authorship links in some countries reflect various tendencies part of which are interpreted with the help of a cardiologic model.

Keywords: Scientific Collaboration, Sciences

? Breimer, L.H. (1996), Authorship on and usage of published papers in current Swedish biomedical theses. *Scientometrics*, **36** (2), 255-258.

Full Text: [1996\Scientometrics36, 255.pdf](1996/Scientometrics36,%20255.pdf)

Abstract: Swedish publication-based biomedical doctoral dissertations examined since 1992 were compared with a sample from 1968-92. Theses in either group had an average of four published papers and one submitted manuscript. The average number of authors per paper was four in the 1992+ sample, an increase of one author on the 1968-92. The candidate was first or sole author on 77% of papers indicating that the same paper is not used for several theses. It is proposed that three papers should form the basis of a common European PhD if this is to be completed, including examined, within three years, and four papers if four years.

Keywords: Author, Authors, Authorship, Biomedical, Dissertations, Papers

Uzun, A. (1996), A bibliometric analysis of physics publications from Middle Eastern countries. *Scientometrics*, **36** (2), 259-269.

Full Text: [1996\Scientometrics36, 259.pdf](1996/Scientometrics36,%20259.pdf)

Abstract: I studied the publication efforts in physics in Egypt, Iran, Iraq, Jordan, Saudi Arabia, Syria, and Turkey in terms of a total number of 2368 papers from these countries in international journals for 1990-1994. I looked for the national contributions, main subjects of activity, journal preferences of authors, and co-authorship patterns. Comparisons show that physicists from Egypt and Turkey combined, produced 75% of the total publication output. Half of the Egyptian papers went only to 16% of a set of 115 journals that publish papers from this country. Such a high concentration of papers in a few journals was not the case for the rest of the countries. Condensed matter physics was found to be among the three most active subjects for the countries except Iran. Iranian authors tended to be more active in astrosciences, and nuclear science and technology. I found a change in the publication patterns of the Middle Eastern physicists in the direction of decreasing isolation and increasing collaboration

Keywords: Bibliometric, Bibliometric Analysis, Citation Impact, Collaboration, English, Journal, Journals, Output, Publication, Science, Scientometrics, Trends, Turkey

Schubert, A. (1996), Scientometrics: A citation based bibliography, 1993. *Scientometrics*, **36** (2), 273-280.

Full Text: [1996\Scientometrics36, 273.pdf](1996/Scientometrics36,%20273.pdf)

Kostoff, R.N. (1996), Performance measures for government-sponsored research: Overview and background. *Scientometrics*, **36** (3), 281-292.

Full Text: [1996\Scientometrics36, 281.pdf](1996/Scientometrics36,%20281.pdf)

Narin, F. and Hamilton, K.S. (1996), Bibliometric performance measures. *Scientometrics*, **36** (3), 293-310.

Full Text: [1996\Scientometrics36, 293.pdf](1996/Scientometrics36,%20293.pdf)

Abstract: Three different types of bibliometrics - literature bibliometrics, patent bibliometrics, and linkage bibliometric can all be used to address various government performance and results questions. Applications of these three bibliometric types will be described within the framework of Weinberg’s internal and external criteria, whether the work being done is good science, efficiently and effectively done, and whether it is important science from a technological viewpoint. Within all bibliometrics the fundamental assumption is that the frequency with which a set of papers or patents is cited is a measure of the impact or influence of the set of papers. The literature bibliometric indicators are counts of publications and citations received in the scientific literature and various derived indicators including such phenomena as cross-sectoral citation, coauthorship and concentration within influential journals. One basic observation of literature bibliometrics, which carries over to patent bibliometrics, is that of highly skewed distributions - with a relatively small number of high-impact patents and papers, and large numbers of patents and papers of minimal impact. The key measure is whether an agency is producing or supporting highly cited papers and patents. The final set of data are in the area of linkage bibliometrics, looking at citations from patents to scientific papers. These are particularly relevant to the external criteria, in that it is quite obvious that institutions and supporting agencies whose papers are highly cited in patents are making measurable contributions to a nation’s technological progress.

Schubert, A. and Braun, T. (1996), Cross-field normalization of scientometric indicators. *Scientometrics*, **36** (3), 311-324.

Full Text: [1996\Scientometrics36, 311.pdf](1996/Scientometrics36,%20311.pdf)

Abstract: Comparative assessment of scientometric indicators is greatly hindered by the different standards valid in different science fields and subfields. Indicators concerning to different fields can be compared only after first gauging them against a properly chosen reference standard, and their relative standing can then be compared. Methods of selecting reference standards and scaling procedures are surveyed in this study, and examples are given to their practical application.

Keywords: Skew Distributions, Countries

? Link, A.N. (1996), Economic performance measures for evaluating government-sponsored research. *Scientometrics*, **36** (3), 325-342.

Full Text: [1996\Scientometrics36, 325.pdf](1996/Scientometrics36,%20325.pdf)

Abstract: The purpose of this paper is to discuss, in general terms, evaluation issues related to government-sponsored research and to describe and critique the usefulness of economic performance measures for evaluating such activity. Herein is presented an overview of the economic justification for government-sponsored research and the rationale for its evaluation. Also, fundamental evaluation methods are described. The paper ends with a recommendation that benefit-cost analysis may be the most appropriate economic performance measure when evaluating government-sponsored research if used cautiously and with an understanding of its inherent subjectivity.

Keywords: Analysis, Basic Research, Evaluation, Overview, Performance Measure, Performance Measures, Productivity Increase, Research

Martin, B.R. (1996), The use of multiple indicators in the assessment of basic research. *Scientometrics*, **36** (3), 343-362.

Full Text: [1996\Scientometrics36, 343.pdf](1996/Scientometrics36,%20343.pdf)

Abstract: This paper argues that evaluations of basic research are best carried out using a range of indicators. After setting out the reasons why assessments of government-funded basic research are increasingly needed, we examine the multi-dimensional nature of basic research. This is followed by a conceptual analysis of what the different indicators of basic research actually measure. Having discussed the limitations of various indicators, we describe the method of converging partial indicators used in several SPRU evaluations. Yet although most of those who now use science indicators would agree that a combination of indicators is desirable, analysis of a sample of Scientometrics articles suggests that in practice many continue to use just one or two indicators. The paper also reports the results of a survey of academic researchers. They, too, are strongly in favour of research evaluations being based on multiple indicators combined with peer review. The paper ends with a discussion as to why multiple indicators are not used more frequently.

Keywords: Accelerators, Cern, Future-Prospects, High-Energy Physics, Past Performance, Research, Science

Melin, G. and Persson, O. (1996), Studying research collaboration using co-authorships. *Scientometrics*, **36** (3), 363-377.

Full Text: [1996\Scientometrics36, 363.pdf](1996/Scientometrics36,%20363.pdf)

Abstract: Scientific collaboration has become a major issue in science policy. The tremendous growth of collaboration among nations and research institutions witnessed during the last twenty years is a function of the internal dynamics of science as well as science policy initiatives. The need to survey and follow up the collaboration issue calls for statistical indicators sensitive enough to reveal the structure and change of collaborative networks. In this context, bibliometric analysis of co-authored scientific articles is one promising approach. This paper discusses the relationship between collaboration and co-authorship, the nature of bibliometric data, and exemplifies how they can be refined and used to analyse various aspects of collaboration.

Keywords: International Scientific Collaboration, Science

? Geisler, E. (1996), Integrated figure of merit of public sector research evaluation. *Scientometrics*, **36** (3), 379-395.

Full Text: [1996\Scientometrics36, 379.pdf](1996/Scientometrics36,%20379.pdf)

Abstract: An approach for evaluation of research is described that integrates output indicators of four stages downstream the innovation process: immediate, intermediate, pre- ultimate and ultimate outputs. Indexes of leading output indicators are constructed. The indexes are integrated cumulatively to form an overall index of key output indicators, which is the integrated figure of merit (IFM). Data for the indicators are obtained from records and key informants, and the indicators are grouped by normalized weights. The paper also discusses the limitations and the methodological, conceptual and political/organizational issues of such an approach to research evaluation.

Keywords: Academic Research, Evaluation, Indexes, Indicators, Industrial-Innovation, Innovation, Process, Research, Research Evaluation, Research-and-Development, Technology

van Raan, A.F.J. (1996), Advanced bibliometric methods as quantitative core of peer review based evaluation and foresight exercises. *Scientometrics*, **36** (3), 397-420.

Full Text: [1996\Scientometrics36, 397.pdf](1996/Scientometrics36,%20397.pdf)

Abstract: This paper gives an overview of the potentials and limitations of bibliometric methods for the assessment of strengths and weaknesses in research performance, and for monitoring scientific developments. We distinguish two different methods. In the first application, research performance assessment, the bibliometric method is based on advanced analysis of publication and citation data. We show that the resulting indicators are very useful, and in fact an indispensable element next to peer review in research evaluation procedures. Indicators based on advanced bibliometric methods offer much more than ‘only numbers’. They provide insight into the position of actors at the research front in terms of influence and specializations, as well as into patterns of scientific communication and processes of knowledge dissemination. After a discussion of technical and methodological problems, we present practical examples of the use of research performance indicators. In the second application, monitoring scientific developments, bibliometric methods based on advanced mapping techniques are essential. We discuss these techniques briefly and indicate their most important potentials, particularly their role in foresight exercises. Finally, we give a first outline of how both bibliometric approaches can be combined to a broader and powerful methodology to observe scientific advancement and the role of actors.

Keywords: Research Performance, Indicators

? Miller, R. and Manseau, A. (1996), Bibliometric indicators and the competitive environment of R&D laboratories. *Scientometrics*, **36** (3), 421-433.

Full Text: [1996\Scientometrics36, 421.pdf](1996/Scientometrics36,%20421.pdf)

Abstract: The R&D laboratory organization attempts to shape and is influenced by complex and changing environments. New contexts affect the types of evaluation required. Traditional approaches to the R&D laboratory evaluation are thus to be questioned. The changing competitive contexts of R&D organization suggest four worlds of innovation: (i) technology races, (II) efficiency in technological systems, (iii) technical parity and (iv) marker contests. In the emerging competitive arena, the R&D laboratory is evolving toward a network type of organization linked to many different partners and acting as a semi-autonomous business unit. New roles are expected from these kinds of laboratories. They have to develop core strategic competencies, offer competitive outputs, meet clients specifications, create new technology standards and maintain or increase their leadership positions. Bibliometric analysis need to be used in complement with many other methods.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Complex, Core, Environment, Evaluation, Indicators, Innovation, Leadership, Methods, Productivity, R&D, Standards, Technology

? MacRoberts, M.H. and MacRoberts, B.R. (1996), Problems of citation analysis. *Scientometrics*, **36** (3), 435-444.

Full Text: [1996\Scientometrics36, 435.pdf](1996/Scientometrics36,%20435.pdf)

Keywords: Analysis, Citation, Citation Analysis, Citer Motivations, Ortega Hypothesis, Science, Scientific Knowledge, Sociology

? Brown, E.A. (1996), Conforming the government R&D function with the requirements of the government performance and results act - Planning the unplannable? Measuring the unmeasurable? *Scientometrics*, **36** (3), 445-470.

Full Text: [1996\Scientometrics36, 445.pdf](1996/Scientometrics36,%20445.pdf)

Abstract: The Army Research Laboratory (ARL) was designated a Pilot Project for Performance Planning under the Government Performance and Results Act of 1993. Of the more than 80 such pilot projects government-wide, ARL was the only organization to represent the R&D community. As such, it was required to break new ground in both the planning and the evaluation of basic and applied research. This paper discusses the efforts made by ARL in both these areas, the insights drawn from these efforts, and the lessons learned.

Keywords: As, Evaluation, Government, Performance, R&D, Research

Campanario, J.M. (1996), Using *Citation Classics* to study the incidence of serendipity in scientific discovery. *Scientometrics*, **37** (1), 3-24.

Full Text: [1996\Scientometrics37, 3.pdf](1996/Scientometrics37,%203.pdf)

Abstract: The main sociological, philosophical and historical approaches only ascribe a relative importance to the role of chance, error, or accident in scientific progress. The literature on this topic tends to be anecdotal, sometimes hagiographic and rarely systematic. The main goal of this paper is to introduce a new approach to the study of serendipity in scientific discovery. This new approach is based in the study of highly cited papers obtained from the Citation Classics feature of Current Contents. This paper re-examines 205 Citation Classics commentaries from the 400 most-cited papers in the recent history of science. Authors of 17 Citation Classics commentaries (8.3%) mention some kind of serendipity in performing the research reported in the highly cited paper. Commentaries are classified and discussed in detail. In addition, I have examinated the original papers identified above. In 5 from the original highly cited papers authors explained or gave enough hints on the way the serendipitous discovery was done.

Keywords: Most-Cited Papers, SCI 1945-1988, Delayed Recognition, Time, Science, History

Six, J. and Bustamante, M.C. (1996), Bibliometric analysis of publications in experimental particle physics on cosmic rays and with accelerators. *Scientometrics*, **37** (1), 25-37.

Full Text: [1996\Scientometrics37, 25.pdf](1996/Scientometrics37,%2025.pdf)

Abstract: In the first part, the present paper presents a quantitative analysis of physics publications in the domain of experimental particle physics, before the Second World War in the field of cosmic rays physics and for the modem times in the field of accelerator and collision rings experiments. In the second part, a more general study is made on publications in the various fields of physics separating contributions from experiment, theory and techniques. Three aspects of physics are enlightened: physics of exploration, physics of applications, and forefront physics.

? Christensen, F.H. and Ingwersen, P. (1996), Online citation analysis - A methodological approach. *Scientometrics*, **37** (1), 39-62.

Full Text: [1996\Scientometrics37, 39.pdf](1996/Scientometrics37,%2039.pdf)

Abstract: The paper investigates the online citation analysis possibilities and limitations. The following online processing tools: RANK, MAP, and TARGET, provided by Dialog, are incorporated in order to perform analyses of citations to and from isolated sets of documents as well as to carry out diachrone journal analyses. These analyses imply further to determine journal impact factors of ISI journals. Measures of the scope of internationalisation of journals are proposed and demonstrated. By the combined application of the RANK and TARGET commands we demonstrate a hitherto overlooked possibility of working with bibliographic coupling online and mapping of scientific fields.

Keywords: Analysis, Bibliographic, Bibliographic Coupling, Citation, Citation Analysis, Citations, Impact, Impact Factors, Information, Internationalisation, ISI, Journal, Journal Impact, Journal Impact Factors, Journals, Map, Mapping, Rank, Target

? Rivas, A.L., Deshler, D., Colle, R.D., Gonzalez, R.N. and Quimby, F.W. (1996), Indicators of disciplinary differentiation: Interdisciplinary linkages and adoption rate of biological innovations. *Scientometrics*, **37** (1), 63-86.

Full Text: [1996\Scientometrics37, 63.pdf](file:///H:\Bibliometric%20References\1996\Scientometrics37,%2063.pdf)

Abstract: Two indicators regarded to reflect the status of disciplinary differentiation were assessed through citation analysis. Adoption of scientific innovations (publications utilizing new scientific information) and interdisciplinary linkages (percentage of total publications of single disciplines which are cross-referenced by other disciplines) were investigated in selected biological professions. Findings indicated: 1) a significant delay in the use of innovations and a significant difference in the emphasis of interdisciplinary linkages in several professions and disciplines; 2) faster adoption of innovations and greater interdisciplinary linkages in areas with broader disciplinary contents; 3) an inter-personal communication pattern; and 4) slower adoption in applied than in basic fields.

Keywords: Analysis, Cell, Citation, Citation Analysis, Communication, Differentiation, Indicators, Information, Interdisciplinary, Publications, Scientific Information

? Raj, C.B.C. (1996), Publications, cost and a proposition. *Scientometrics*, **37** (1), 87-103.

Full Text: [1996\Scientometrics37, 87.pdf](1996/Scientometrics37,%2087.pdf)

Abstract: The cause and effect that led to the enormous growth of research journals during the past few decades are analyzed. These factors seem to have contributed to the financial pressure on the academic library system and the ‘publishing pressure’ on the researchers. Overall, the higher educational system in chemistry, as well as all sciences and humanities, seem to have been affected. Printing practices of a few research journals, mostly in chemistry and chemical engineering, are compared in terms of price per standardized page which indicate that savings of several million dollars should be possible worldwide through a coherent effort of the various members of the research community. Certain simple propositions to cut down the volume of publications have been discussed. More propositions are likely to be put forward by those who start to think about journal proliferation and the underlying issues.

Keywords: Growth, Journal, Journals, Pressure, Publications, Publishing, Research, Researchers, Sciences, Unnecessary Journals

? Moed, H.F., vanLeeuwen, T.N. and Reedijk, J. (1996), A critical analysis of the journal impact factors of Angewandte Chemie and the Journal of the American Chemical Society - Inaccuracies in published impact factors based on overall citations only. *Scientometrics*, **37** (1), 105-116.

Full Text: [1996\Scientometrics37, 105.pdf](1996/Scientometrics37,%20105.pdf)

Abstract: it is shown that the Journal Impact Factor as published by ISI - an indicator increasingly used as an measure for the quality of scientific journals - is misleading when two leading journals in chemistry, Angew. Chem., and J. Am. Chem. Sec., are compared. A detailed analysis of the various kinds publications in both journals over the period 1982-1994 shows that the overall impact factors based on publications and citations in two consecutive years for JACS communications (5.27 for 1993) are significantly higher than those of Angew. Chem. (3.26 for 1993). Even when all types of articles, i.e. including reviews, are included in the impact factors, JACS has a higher score than Angew. Chem. (5.07 vs. 4.03 in 1993). Critical and accurate analyses of citation figures is required when such data are used in science policy decisions, such as library subscriptions. It is proposed that when IF values for several journals are compared, only similar publication types are considered.

Keywords: Analysis, Articles, Citation, Citations, Critical, Impact, Impact Factor, Impact Factors, ISI, Journal, Journal Impact, Journal Impact Factors, Journals, Policy, Publication, Publications, Quality, Science, Science Policy, Scientific Journals

Korevaar, J.C. and Moed, H.F. (1996), Validation of bibliometric indicators in the field of mathematics. *Scientometrics*, **37** (1), 117-130.

Full Text: [1996\Scientometrics37, 117.pdf](1996/Scientometrics37,%20117.pdf)

Abstract: Bibliometric analyses of scientific publications provide quantitative information that enables evaluators to obtain a useful picture of a team’s research visibility. In combination with peer judgements and other qualitative background knowledge, these analyses can serve as a basis for discussions about research performance quality. However, many mathematicians are not convinced that citation counts do in fact provide useful information in the field of mathematics. According to these mathematicians, citation and publication habits differ completely from scholarly fields such as chemistry or physics. Therefore, it is impossible to derive valid information regarding research performance from citation counts. The aim of this study is to obtain more insight into the significance of citation-based indicators in the field of mathematics. To which extent do citation-scores mirror to the opinions of experts concerning the quality of a paper or a journal? A survey was conducted to answer this question. Top journals, as qualified by experts, receive significantly higher citation rates than good journals. These good journals, in rum, have significantly higher scores than journals with the qualification less good. Top publications, recorded in the ISI database. receive on the average 15 times more citations than the mean score within the field of mathematics as a whole. In conclusion, the experts’ views on top publications or top journals correspond very well to bibliometric indicators based on citation counts

Keywords: Bibliometric, Citation, Citations, English, Journal, Journals, Publication, Research, Research Performance, SCI, Science, Scientific Publications, Scientometrics, Visibility

? Plaza, L.M., Martín, M.J. and Rey, J. (1996), Scientific relations between Spain and Central-Eastern European countries for the period 1982-1992. *Scientometrics*, **37** (1), 131-142.

Full Text: [1996\Scientometrics37, 131.pdf](1996/Scientometrics37,%20131.pdf)

Abstract: This paper analyzes the scientific relationships between Spain and the Eastern European countries (EEc), including the former USSR, from 1982 to 1992. The study considers the number of co-authored papers as well as the number of stays which reflect to the exchange of scientists among them. The total number of co-authored papers of Spanish scientists with their colleagues of those countries is 664 as recorded in the Science Citation Index. During the last three years, a significative increase in the number of co-signed papers has been observed. From the sample considered, the percentage of bilateral and multilateral co-authored papers is 43.8 and 56.2 respectively. In absolute figures, USSR and Poland are the countries with highest number of collaborative papers with Spain. However, in relation to their scientific output, Poland and Hungary show a higher percentage of co-authored papers than the rest of EEc. On the other hand, previous data, provided by the Spanish Secretary of State for Research and Universities (SEUI), related to the flow of scientists on sabbatical year to and from Spain,(1) showed that from 1984 to 1994, a total of 213 researchers come from the EEc to Spain, while the number of Spanish scientists going to those countries was extremely scarce.

Keywords: Citation, Countries, Hand, Hungary, Papers, Research, Researchers, Science, Science Citation Index, Scientific Output, Spain, Universities

? Papadopoulos, S. (1996), Evaluation of industrial research. *Scientometrics*, **37** (1), 143-151.

Full Text: [1996\Scientometrics37, 143.pdf](1996/Scientometrics37,%20143.pdf)

Keywords: Evaluation, Research

? Persson, O. and Melin, G. (1996), Equalization, growth and integration of science. *Scientometrics*, **37** (1), 153-157.

Full Text: [1996\Scientometrics37, 153.pdf](1996/Scientometrics37,%20153.pdf)

Abstract: A study of the production of scientific papers, co-authorships, and R&D-expenditures shows that science is becoming more equally distributed among the OECD-countries. Papers in the journal Science are more unequally distributed than papers in Science Citation Index as a whole or the distribution of R&D-investments. Scientific collaboration, is a major factor affecting the distribution of scientific papers.

Keywords: Citation, Co-Authorships, Collaboration, Growth, Integration, Journal, OECD Countries, OECD-Countries, Papers, Science, Science Citation Index, Scientific Collaboration

Uzun, A. and Ozel, M.E. (1996), Publication patterns of Turkish astronomers. *Scientometrics*, **37** (1), 159-169.

Full Text: [1996\Scientometrics37, 159.pdf](1996/Scientometrics37,%20159.pdf)

Abstract: We studied 187 papers published in the journals on astronomy and astrophysics indexed in the Science Citation Index (SCI) for the decade period 1985-1994. These have been the papers that included at least one author listing an address from an institution in Turkey. We found that a great majority of the papers, whether theoretical or observational, went to only very small number (three) of a total set of 34 journals in the area. The distribution of papers by institutions revealed that about three fourths of the papers came from two universities: the Aegean University, and the Middle East Technical University (METU). We also found that the fraction of multiple authored papers has increased appreciably and the number of citations an ‘average’ paper received has decreased gradually during the period considered.

Keywords: Turkey

? Breimer, L.H. (1996), Age, sex and standards of current doctoral theses by Swedish medical graduates. *Scientometrics*, **37** (1), 171-176.

Full Text: [1996\Scientometrics37, 171.pdf](1996/Scientometrics37,%20171.pdf)

Abstract: Recent Swedish publication-based doctoral dissertations by medical practitioners contained an average of four published papers and one manuscript per theses. The average number of authors per paper was four. The candidate was the first author on 83% of papers indicating that the same paper was not used to support several theses. 82% of the candidates had completed their specialist training: 24% of these were women; surgeons were the biggest single group. The average age in years was: surgeons 40 (34-48); non-surgeons 41 (34-49); and 35 (32-36) for those who had just completed their basic post-qualification registration. These findings are in keeping with the Swedish tradition of scientific and evidence based medicine.

Keywords: Age, Author, Authors, Dissertations, Doctoral Theses, Medical, Medicine, Papers, Registration, Sex, Standards, Training, Women

? Zhang, H.Q. (1996), Research performance in key medical universities in China observed from the scientific productivity. *Scientometrics*, **37** (1), 177-190.

Full Text: [1996\Scientometrics37, 177.pdf](1996/Scientometrics37,%20177.pdf)

Abstract: Research activities in the lift: sciences during the past few years, have increased appreciably in China, both in regard to relative output of publications and in their impact on the international research community. The purpose of this study is to analyze and evaluate quantitatively the scientific productivity of key medical universities in China by using CBMdisc, MEDLINE and SCI databases. The results showed that Tongji Medical University ranks first in terms of paper output in Chinese and in English languages, while Beijing Medical University is placed second in output but is first in citation impact. Shanghai Medical University had the top annual paper output per scientist, with 2.53 papers in Chinese and 0.13 papers in English. The results also showed that the coverage of Chinese biomedical publications by western indexing services is very poor.

Keywords: Life Sciences, Publication, Japan

? van Raan, A.F.J. (1996), Introduction to the proceedings of the Fourth International Conference on Science and Technology Indicators. *Scientometrics*, **37** (2), 191-193.

Full Text: [1996\Scientometrics37, 191.pdf](1996/Scientometrics37,%20191.pdf)

Keywords: Conference, Indicators, International, Science, Technology

? Glanzel, W. and Czerwon, H.J. (1996), A new methodological approach to bibliographic coupling and its application to the national, regional and institutional level. *Scientometrics*, **37** (2), 195-221.

Full Text: [1996\Scientometrics37, 195.pdf](1996/Scientometrics37,%20195.pdf)

Abstract: In an earlier study the authors have shown that bibliographic coupling techniques can be used to identify ‘hot’ research topics. The methodology is based on appropriate thresholds for both number of related documents and the strength of bibliographic links. Those papers are called core documents that have more than 9 links of at Least the strength 0.25 according to Salton’s measure, provided they are articles, notes or reviews. This choice resulted in a selection of nearly one per cent of all papers of the above types recorded in the 1992 annual cumulation of the SCI. Core documents proved important nodes in the network of documented science communication. In the present study, the set of core documents is analysed by journals, subfields and corporate addresses. The latter analysis is conducted on both national and regional-institutional level. First all countries which have published at least 20 core documents in 1992 are investigated in terms of their research profiles, their international collaboration patterns and their citation impact. Finally, those eight members of the European Union which have published at least 20 core documents in 1992 are analysed in respect of regional and institutional distribution of core documents.

Keywords: Analysis, Articles, Authors, Bibliographic, Bibliographic Coupling, Citation, Citation Impact, Co-Citation, Collaboration, Communication, Core Documents, Core-Documents, Countries, Impact, Indicators, International Collaboration, Journals, Methodology, Network, Papers, Research, Research Topics, SCI, Science, Science Communication, Strength, Topics

? Zitt, M. and Bassecoulard, E. (1996), Reassessment of co-citation methods for science indicators: Effect of methods improving recall rates. *Scientometrics*, **37** (2), 223-244.

Full Text: [1996\Scientometrics37, 223.pdf](1996/Scientometrics37,%20223.pdf)

Abstract: wAlthough co-citation techniques are very powerful structuring tools, the use of science policy indicators based on co-citation has often been criticized, especially on ISI research fronts. A major issue is the small fraction of literature retrieved, i.e. the “recall rate” problem. Our investigations indicate that at the level of micro/meso studies high recall rates can be achieved by (a) the use of appropriate clustering techniques limiting singletons and (b) the enrichment of cocited cores by medium-cited items. This combination of appropriate clustering and extension of recall proves to be efficient, provided that careful trade-offs are sought between the extension and relevance of recall. It leads to a reassessment of the performance of the co-citation approach for structuring scientific fields and providing related indicators not limited to the ‘leading edge’. It also opens new opportunities for comparison/combination with other relational methods such as co-word analysis.

Keywords: Analysis, Clustering, Cocitation, Cocitation Analysis, Fraction, Index, Indicators, ISI, Literature, Policy, Research, Science, Science Policy, Scientific Literatures

? Niwa, F. and Tomizawa, H. (1996), A trial of general indicator of science and technology: Methodological study of overall estimation of national S&T activity. *Scientometrics*, **37** (2), 245-265.

Full Text: [1996\Scientometrics37, 245.pdf](1996/Scientometrics37,%20245.pdf)

Abstract: This paper presents methods using a large number of quantitative indicators of the overall estimation of national S&T activity. The methods collected here apply multivariate analysis techniques to a set of S&T indicators to investigate its structure and extract a single or a small number of indicators of S&T activity. We perform structural analysis and integration of 14 main S&T indicators in 5 countries, the U.S., Japan, Germany, France and the U.K. Latent variables underlying this set of indicators naturally emerge from this analysis, and from these we were able to extract valuable information concerning the nature of S&T activity in each country. This method was also useful for investigating the nature and interpretation, as well as the reliability, of previous S&T indicators.

Keywords: Analysis, Countries, France, Germany, Indicators, Information, Integration, Interpretation, Japan, Patents, Quantitative, Reliability, Science, Science and Technology, Technology

Tomov, D.T. and Mutafov, H.G. (1996), Comparative indicators of interdisciplinarity in modern science. *Scientometrics*, **37** (2), 267-278.

Full Text: [1996\Scientometrics37, 267.pdf](1996/Scientometrics37,%20267.pdf)

Abstract: A set of scientometric indicators of interdisciplinary links between advancing fields of biomedicine is suggested. Twenty journals listed in the JCR of the SCI for 1988 are analyzed. An index of interdisciplinarity for a given journal is calculated as the sum of ratios between the numbers of journals from all other disciplines (except for general-scientific and miscellaneous journals) and from the same discipline cited by that journal or citing it, and of ratios between the numbers of citations to and by these journals. Some interdisciplinary patterns of 20 andrology journal articles are scientometrically assessed, too. The combined usage of this method with coclassification and co-citation methodology can optimize interdisciplinarity evaluation and promotion.

Keywords: Scientific Field, Co-Citations

? Borrons, M., Gomez, I., Fernandez, M., Zulueta, M. and Mendez, A. (1996), Local, domestic and international scientific collaboration in biomedical research. *Scientometrics*, **37** (2), 279-295.

Full Text: [1996\Scientometrics37, 279.pdf](1996/Scientometrics37,%20279.pdf)

Abstract: Collaboration practices and partners vary greatly per scientific area and discipline and influence the scientific performance. Bibliometric indicators are used to analyse international, domestic and local collaboration in publications of Spanish authors in three Biomedical subfields: Neurosciences, Gastroenterology and Cardiovascular System as covered by the SCI database. Team size, visibility and basic-applied level of research were analysed according to collaboration scope. International collaboration was linked to higher visibility documents. Cluster analysis of the most productive authors and centres provides a description of collaboration habits and actors in the three subfields. A positive correlation was found between productivity and international and domestic collaboration at the author level.

? Artus, H.M. (1996), Science indicators derived from databases - The case of the social sciences. *Scientometrics*, **37** (2), 297-311.

Full Text: [1996\Scientometrics37, 297.pdf](1996/Scientometrics37,%20297.pdf)

Abstract: Quantitative data or indicators derived from databases are usually treated like any other empirical data. In this article, the social character of the different processes leading to them is outlined. As a social process taking place in systemic organizational structures the genesis of such data cannot be reconstructed as sort of mechanical application of formal rules but only as human (and as such: arbitrary) action. As a consequence the discussion of such data or indicators can no longer be subject to methodology alone but requires support by sociology.

Keywords: As, Character, Databases, Human, Indicators, Methodology, Process, Processes, Science, Science Indicators, Sciences, Social, Social Sciences, Sociology

? Hinze, S. and Grupp, H. (1996), Mapping of R and D structures in transdisciplinary areas: New biotechnology in food sciences. *Scientometrics*, **37** (2), 313-335.

Full Text: [1996\Scientometrics37, 313.pdf](1996/Scientometrics37,%20313.pdf)

Abstract: This study analyses activities in new biotechnology in food science and technology using bibliometric methods. Multidimensional scaling is used to visualise the structure of the field as represented by scientific literature and patent applications. For the science as well for the technology side increasing activities in the field were found. The specialisation analysis shows above average specialisation at the science and the technology side of the EU member countries (except for Germany) as well as for the USA. Within the EU also less developed countries intensified their R&D activities. At the science side aspects of food safety and quality are highly relevant. These topics are also tackled at the technology side but compared to the science side these sub-fields seem to be still more isolated within the structure of the field. Structural differences between the science and the technology side partly may be explained by special features of the patent law in biotechnology.

Sigogneau, A. (1996), Between policy categories and research activities: Reviews and journals to describe ‘environment’ networks. *Scientometrics*, **37** (2), 337-348.

Full Text: [S\Scientometrics37, 337.pdf](S/Scientometrics37,%20337.pdf)

Abstract: This article presents a scientometric procedure which assists in the production of bibliometric indicators for conducting international comparisons about transdisciplinary research field. The procedure aims at the analysis of how a nomenclature in the field of the environment, established by public research administrators, translates into subsets of scientific journals. Relations between the nomenclature and scientific disciplines were obtained through analysis of reviews. The environmental field’s structure has been analysed by using journal cross-citation data.

? de Looze, M.A. (1996), Scientometrics as a tool for analysis of the industrial relationships of two departments in a major French Applied Research Institute, 1988-1992. *Scientometrics*, **37** (2), 349-360.

Full Text: [1996\Scientometrics37, 349.pdf](1996/Scientometrics37,%20349.pdf)

Abstract: To study the nature of interactions between the laboratories’ industrial relationships and their scientific policies we posit that by drawing on enhanced knowledge of such interaction, recommendations concerning the management of industrial relationships can be formulated. The tools used are: - extraction of documentary references from PUBINRA (in-house database of publications by INRA researchers) followed by counts per laboratory, characterization of applied and fundamental research publications based on a classification of periodicals’ in the Science Citation Index, updated and completed with the help of researchers from the INRA Departments, mobilization of bibliometric variables in a body of synthesized variables, to account for the role of partnerships in a laboratory’s production.

Keywords: Technology, Science

? Markusova, V.A., Gilyarevskii, R.S., Chernyi, A.I. and Griffith, B.C. (1996), Information behavior of Russian scientists in the “Perestroika” period - Results of the questionnaire survey. *Scientometrics*, **37** (2), 361-380.

Full Text: [1996\Scientometrics37, 261.pdf](1996/Scientometrics37,%20261.pdf)

Keywords: Behavior, Questionnaire, Questionnaire Survey, Science, Survey

? (1996), Centre for informetric studies. *Scientometrics*, **37** (2), 381.

Full Text: [1996\Scientometrics37, 381.pdf](1996/Scientometrics37,%20381.pdf)

? Breimer, L.H. (1996), Authorship on and usage of published papers in current Swedish biomedical theses (vol 36, pg 255, 1996). *Scientometrics*, **37** (2), 383.

Full Text: [1996\Scientometrics37, 283.pdf](1996/Scientometrics37,%20283.pdf)

Keywords: Authorship, Biomedical, Papers

? Lin, Y. (1996), Empirical studies of negative political advertising: A quantitative review using a method of combined citation and content analysis. *Scientometrics*, **37** (3), 385-399.

Full Text: [1996\Scientometrics37, 385.pdf](1996/Scientometrics37,%20385.pdf)

Abstract: This study quantitatively reviews the empirical studies of negative political advertising. A method of the combination of citation analysis and content analysis is used. The citation analysis examines each cited work in 20 selected studies with respect to its citation information, and the content analysis investigates these 20 selected studies (citing sources) in terms of their hypotheses, research questions, and methodologies. The aggregated information from the individual cited works and the citing works show that scholars from communication and other disciplines have strong influence on the development of the empirical studies on negative political ads, but communication scholars remain as the driving force: Facing continuously increased literatures in the area, communication scholars need to develop a theory or theories to guide the research. The direction of the research has been moving toward focusing on the boarder and more general effects of negative political ads.

Keywords: ADS, Advertising, Analysis, Citation, Citation Analysis, Communication, Communication Journals, Content Analysis, Development, Driving, Effects, General, Information, Patterns, Research, Review, Reviews, Sources, Theory

Lewison, G. (1996), The frequencies of occurrence of scientific papers with authors of each initial letter and their variation with nationality. *Scientometrics*, **37** (3), 401-416.

Full Text: [1996\Scientometrics37, 401.pdf](1996/Scientometrics37,%20401.pdf)

Abstract: This paper introduces ‘alphabet spectra’ which are the 26 frequencies of occurrence of scientific papers in a given sample with at least one author of each initial, A, B,...Z. The sum of these frequencies exceeds unity because of multiple authorships. Formulae are given relating this sum to the mean number of authors per paper in the sample. The method is applied to show the increase in this number over the last 15 years in different fields of science and for different countries. The ‘alphabet spectra’ vary greatly depending on the nationality of the scientists concerned and can be compared to frequency absorption spectra for chemical elements or molecules. The spectra can be used to determine the national composition of a country’s scientific authors and how this has changed with time.

Keywords: Absorption, Chemical, Chemical Elements, Composition, Elements, Occurrence, Paper, Science

? Hemlin, S. and Gustafsson, M. (1996), Research production in the arts and humanities - A questionnaire study of factors influencing research performance. *Scientometrics*, **37** (3), 417-432.

Full Text: [1996\Scientometrics37, 417.pdf](1996/Scientometrics37,%20417.pdf)

Abstract: This study explored the main factors influencing the research production in the arts and humanities. A questionnaire was constructed to identify and assess the effects of various factors important for the productivity of the individual researcher as reflected in the number of papers and Ph.D.’s produced. First, respondents were given the opportunity to list in their own words a number of important factors influencing research productivity. Secondly, they evaluated on rating scales the importance of a number of pre-selected factors (e.g. individual characteristics, organisational features, external factors) assumed to be important for research productivity. 50% of a sample of 256 researchers in the humanities responded. Ratings were grouped to produce a number of indices and these were subject to multiple regression analyses. The main results showed that the production of papers was predicted by the number of Ph.D.’s produced and inversely related to the importance of organisational factors. The production of Ph.D.’s was dependent on the year of the Ph.D. and the position of the respondent as well as on the number of papers s/he produced. A number of conclusions were drawn: a) there was support for the academic social position effect also in the humanities, b) organisational factors apparently played a minor role in comparison to individual characteristics in the humanities than in the sciences and, c) the differences in productivity of papers were also related to gender, but not to size, area or language of publications. Implications for further studies were suggested.

Keywords: Academic, Characteristics, Comparison, Effects, Features, Gender, Importance, Language, Multiple Regression, Performance, Position, Production, Productivity, Publications, Questionnaire, Regression, Research, Research Performance, Research Productivity, Role, Scales, Sciences, Size, Social, Support

? van Caulil, G.F., Mombers, C.A.M. and van den Beemt, F.C.H.D. (1996), Quantifying the utilization of research: The difficulties and two models to evaluate the utilization of research results. *Scientometrics*, **37** (3), 433-444.

Full Text: [1996\Scientometrics37, 433.pdf](1996/Scientometrics37,%20433.pdf)

Abstract: Although there are several methods for determining the quality of scientific research, there is no satisfactory method known that can measure the utilization of it. Earlier proposed methods measure a particular kind of utilization, but are - in practice - a poor indication for the utilization on the whole, a concept for which a definition is hard to make. These methods do not comply with the construct validity. The main problem in this case is the great diversity of what we mean by use of results of scientific research, resulting in a lack of consensus on the criteria for assessing the utilization. Here, we propose and discuss two methods. To evaluate utilization in a broad sense the four-dimensional model describes the degree of utilization with three, mostly independent, aspects: the involvement of the user, the availability of a transferable research product, and the commercial benefits resulting from the research results. In the other method the utilization of the research results is described first, and subsequently the utilization is quantified by a jury, who group the different projects in five classes, based on a Guttman scale.

Keywords: Availability, Concept, Consensus, Diversity, Group, Methods, Model, Models, Practice, Quality, Research, Research Performance, Research Results, Scale, Utilization, Validity

? Prpic, K. (1996), Scientific fields and eminent scientists’ productivity patterns and factors. *Scientometrics*, **37** (3), 445-471.

Full Text: [1996\Scientometrics37, 445.pdf](1996/Scientometrics37,%20445.pdf)

Abstract: A questionnaire study of 385 eminent Croatian scientists has examined the quantity, patterns and factors of their scientific production in four different scientific fields. The findings confirm the thesis that the contextual influences will be even more expressed within this elite group than within the whole research population. Thus the respondents’ scientific productivity much clearly shows the patterns typical for their scientific fields. The initial thesis is also supported by a very differentiated composition and the explanatory power of the productivity predictors in the observed fields. Yet, the scientific and linguistic qualifications, within a narrower predictors’ block, and the involvement in the international scientific activity, in a broader one, were the most important productivity factors in most fields.

Keywords: Activity, Composition, Developing-Countries, Group, Impact, Index, Inequality, International Collaboration, Performance, Population, Predictors, Production, Productivity, Quantity, Questionnaire, Research, Science, Scientific Production, Scientific Productivity

? Bourke, P. and Butler, L. (1996), Publication types, citation rates and evaluation. *Scientometrics*, **37** (3), 473-494.

Full Text: [1996\Scientometrics38, 473.pdf](1996/Scientometrics38,%20473.pdf)

Abstract: In order to resolve questions frequently raised in the context of research evaluation about the citation rates of journal publications in relation to other types of publications, the total research output of substantial institutions or systems has to be brought under bibliographic control. That precondition has rarely been met: there are few published studies of the total range of publications of major research institutions, including books, book chapters, technical reports and published conference proceedings. The Research Evaluation and Policy Project (REPP) at the Australian National University (ANU) has established a database covering all the publications from the Institute of Advanced Studies (IAS), a full-time research institution at the ANU, and has examined in detail citations in the journal literature accruing to all types of publications. The database contains a significant number of publications, nearly 30 000 items, and covers the sciences and the social sciences and humanities. This data enables us to examine whether the citation record of research publications appearing in journals indexed by the Institute for Scientific information (ISI) is a useable surrogate for the citation record within ISI journals of all model of publication. We contend that, if certain preconditions am met, the choice of citation rate is not critical.

Keywords: Citation, Citations, Control, Evaluation, Institute For Scientific Information, Institutions, ISI, Journal, Model, Order, Output, Publication, Publications, Range, Research, Research Evaluation, Sciences, Social, Social Sciences

? Balaban, A.T. (1996), How should citations to articles in high- and low-impact journals be evaluated, or what is a citation worth? *Scientometrics*, **37** (3), 495-498.

Full Text: [1996\Scientometrics37, 495.pdf](1996/Scientometrics37,%20495.pdf)

Abstract: After a brief discussion on the normalization factors allowing the quantitative comparison between various disciplines, a formula is proposed for taking into account the value of citations to papers published in journals with different impact factors.

Keywords: Brief, Citation, Citations, Comparison, Impact, Impact Factors

? Wouters, P. and Leydesdorff, L. (1997), Proceedings of the Erasmus Workshop on Quantitative Approaches to Science & Technology Studies - Amsterdam, 21-24 May 1996 - Introduction. *Scientometrics*, **38** (1), 3-5.

Full Text: [1997\Scientometrics38, 3.pdf](1997/Scientometrics38,%203.pdf)

? Rip, A. (1997), Qualitative conditions of scientometrics: The new challenges. *Scientometrics*, **38** (1), 7-26.

Full Text: [1997\Scientometrics38, 7.pdf](1997/Scientometrics38,%207.pdf)

Abstract: While scientometrics is now an established field, there are challenges. A closer look at how scientometricians aggregate building blocks into artfully made products, and point-represent these (e.g. as the map of field X) allows one to overcome the dependence on judgements of scientists for validation, and replace or complement these with intrinsic validation, based on quality checks of the several steps. Such quality checks require qualitative analysis of the domains being studied. Qualitative analysis is also necessary when noninstitutionalized domains and/or domains which do not emphasize texts are to be studied. A further challenge is to reflect on the effects of scientometrics on the development of science, indicators could lead to ‘induced’ aggregation. The availability of scientometric tools and insights might allow scientists and science to become more reflexive.

Keywords: Aggregate, Aggregation, Analysis, Availability, Bibliometric Indicators, British Science, Building, Decline, Dependence, Development, Effects, Indicators, Lead, Made, Products, Qualitative, Quality, Science, Scientometrics, Tools, Validation

? Luukkonen, T. (1997), Why has Latour’s theory of citations been ignored by the bibliometric community? Discussion of sociological interpretations of citation analysis. *Scientometrics*, **38** (1), 27-37.

Full Text: [1997\Scientometrics38, 27.pdf](1997/Scientometrics38,%2027.pdf)

Abstract: The paper discusses the often lamented lack of a theory of citations, and the lack of a sociological theory in particular. It draws attention to one proposed theory and discusses the potential reasons why it has not been generally accepted as the theory of citations, despite its merits in explaining many phenomena in the citation behaviour of scientists. This theory has been expounded by Latour and presented, in particular, in his book entitled Science in Action.

Keywords: Analysis, Attention, Bibliometric, Citation, Citation Analysis, Citations, Community, Paper, Theory

? Wouters, P. (1997), Citation cycles and peer review cycles. *Scientometrics*, **38** (1), 39-55.

Full Text: [1997\Scientometrics38, 39.pdf](1997/Scientometrics38,%2039.pdf)

Abstract: Hardly anyone will dispute that the creation of the Science Citation Index has made an important difference to science. It is less clear, however, in what way the science system has been influenced. This article proposes a qualitative model to better understand the mutual interactions involved. Science is pictured as an information processing cycle. Its quality is maintained in the “peer review cycle”. The main upshot of the SCI has been the creation of a second-order cycle on top of the primary knowledge production cycle. This is the citation cycle. The specialty of scientometrics has a key role in this citation cycle. The model enables a more profound understanding of the various feed back processes between the two cycles. Moreover, it may give insight in the development of hybrid and heterogenous scientific specialties like scientometrics.

Keywords: Citation, Creation, Development, Feed, Hybrid, Indicators, Information, Interactions, Key, Knowledge, Made, Model, Peer Review, Processing, Production, Qualitative, Quality, Review, Role, SCI, Science, Science Citation Index, Scientometrics, Second Order, Specialties

? Barre, R. (1997), The European perspective on S&T indicators. *Scientometrics*, **38** (1), 57-70.

Full Text: [1997\Scientometrics38, 57.pdf](1997/Scientometrics38,%2057.pdf)

Abstract: The S&T indicators activity is first described as a complex process involving a variety of functions, capabilities and institutions, this provides a framework to assess the S&T indicators activity in a country or, more generally, in a research system. Then, the main features of the S&T indicators scene in Europe are presented: regarding the countries, the diversity of the institutional settings and the growing potentials is stressed, among countries, at European level, the important and original role of the European Commission in the dynamics of the S&T indicators activites in Europe is presented, finally, it is argued that the European scene consists of a diversity of research groups which are in competition and collaboration, sharing a number of intellectual concerns and orientations. The perspectives for S&T indicators activity in the EU countries are defined by the greater quantity of source data, by the conceptual advances regarding the S&T system and by the new needs of the decision-makers. In conclusion, some alternative scenarios are suggested.

Keywords: Activity, Collaboration, Competition, Complex, Diversity, Dynamics, EU, Europe, European Commission, Features, Groups, Indicators, Institutions, Process, Quantity, Research, Role, Scenarios, Source

Cunningham, P. (1997), The evaluation of European programmes and the future of scientometrics. *Scientometrics*, **38** (1), 71-85.

Full Text: [1997\Scientometrics38, 71.pdf](1997/Scientometrics38,%2071.pdf)

Abstract: This paper presents the results of an examination of a selection of published European evaluations. The incidence of quantitative and scientometric approaches has been reviewed and an assessment made of their contributory role in each evaluation. The various approaches have been broadly categorised according to the type of data they draw upon, and by the issues they attempt to address. The author analyses such approaches with regard to the degree of success in meeting the objectives of the evaluation. In the light of this some likely future trends are suggested.

Keywords: Assessment, Evaluation, Examination, Incidence, Light, Made, Paper, Role, Scientometrics, Selection, Trends

? VanderMeulen, B.J.R. (1997), The use of S&T indicators in science policy: Dutch experiences and theoretical perspectives from policy analysis. *Scientometrics*, **38** (1), 87-101.

Full Text: [1997\Scientometrics38, 87.pdf](1997/Scientometrics38,%2087.pdf)

Abstract: The relation between bibliometrics and science policy remains underdeveloped. Relevance of new methods to produce indicators is easily claimed, but often without real insight in the policy processes. Drawing on experiences with the use of S&T indicators in science policy in the Netherlands and on principal-agent theory, I develop an analytical perspective which enables to assess the role of S&T indicators in science policy. It is argued that the use of S&T indicators can only be understood well if one takes the socio- political context with its specific dynamics and rationalities into account.

Keywords: Analysis, Bibliometrics, Dynamics, Indicators, Methods, Policy, Policy Analysis, Role, Science, Science Policy, Science-Policy, Theory

? Schmoch, U. (1997), Indicators and the relations between science and technology. *Scientometrics*, **38** (1), 103-116.

Full Text: [1997\Scientometrics38, 103.pdf](1997/Scientometrics38,%20103.pdf)

Abstract: The relationship between science and technology is an important issue, as science-based technologies play a key role in modern economies. The exploration of the science-technology interface can be effectively supported by quantitative indicators, in particular patents of scientific institutions, publications of industrial enterprises, and scientific, references in patent search reports. The most promising approach is the parallel observation of patents and publications in order to analyse the dynamics of the interaction of science and technology and the professional move of academic and industrial researchers between institutions.

Keywords: Academic, Dynamics, Enterprises, Exploration, Indicators, Industrial, Institutions, Interaction, Interface, Key, Knowledge, Observation, Order, Patents, Publications, Role, Science, Scientific Institutions, Technologies

Blauwhof, G. (1997), Mapping the dynamics of telephone switching devices. *Scientometrics*, **38** (1), 117-140.

Full Text: [1997\Scientometrics38, 117.pdf](1997/Scientometrics38,%20117.pdf)

Abstract: In this contribution relations between scientific articles, conference proceedings and patents relating to telephone switching are analyzed. The state-of-the-art in scientometrics and science and technology studies leads one to expect relations among these documents. Empirical findings show the opposite. To interpret these findings I focus on two key issues in scientometrics, namely the frequency of linkages among documents and the nature of communication. The resulting conclusion is that scientometrics should be informed by theories concerning the evolutionary dynamics of science and technology.

Keywords: Communication, Dynamics, Key, Patents, Science, Scientometrics, Technology

Katz, J.S. and Hicks, D. (1997), Desktop scientometrics. *Scientometrics*, **38** (1), 141-153.

Full Text: [1997\Scientometrics38, 141.pdf](1997/Scientometrics38,%20141.pdf)

Abstract: Advanced scientometric tools are moving from the realm of the privileged few with access to mainframe and minicomputers to the desktop of researchers equipped with personal computers. This shift is not only due to the decreasing cost and technological advances in PCs but the ready availability of a powerful multitasking operating system, a versatile text processing language and easy access to the Internet. Furthermore, the latest releases of PC software, such as Microsoft Excel, make it possible to develop graphical user interfaces into complex bibliometric data for a wide spectrum of researchers and policy analysts. Recent developments in digital communication, in particular, tools to access the Internet via the World Wide Web will provide even greater flexibility to those researchers wishing to make their scientometric data available to a diverse international audience. This paper examines how the BESST project developed a Desktop Scientometric environment using public domain, hardware independent software, prototyped a graphical user interface to provide easy access to UK sectoral level bibliometric data and gives a glimpse into future developments.

Keywords: Access, Availability, Bibliometric, Communication, Complex, Computers, Cost, Environment, Flexibility, Graphical User Interface, Interface, Interfaces, Internet, Language, Paper, Policy, Processing, Scientometrics, Software, Tools, Uk, World Wide Web

Leydesdorff, L. and Van den Besselaar, P. (1997), Scientometrics and communication theory: Towards theoretically informed indicators. *Scientometrics*, **38** (1), 155-174.

Full Text: [1997\Scientometrics38, 155.pdf](1997/Scientometrics38,%20155.pdf)

Abstract: The theory of citations should not consider cited and, or citing agents as its sole subject of study. One is able to study also the dynamics in the networks of communications. While communicating agents (e.g., authors, laboratories, journals) can be made comparable in terms of their publication and citation counts, one would expect the communication networks not to be homogeneous. The latent structures of the network indicate different codifications that span a space of possible ‘translations’. The various subdynamics can be hypothesized from an evolutionary perspective. Using the network of aggregated journal-journal citations in Science & Technology Studies as an empirical case, the operation of such subdynamics can be demonstrated. Policy implications and the consequences for a theory-driven type of scientometrics will be elaborated.

Keywords: Agents, Citation, Citations, Communication, Consequences, Dynamics, Homogeneous, Indicators, Made, Operation, Publication, Science, Scientometrics, Technology, Theory

Braun, T. and Schubert, A. (1997), Dimensions of scientometric indicator datafiles: World science in 1990-1994. *Scientometrics*, **38** (1), 175-204.

Full Text: [1997\Scientometrics38, 175.pdf](1997/Scientometrics38,%20175.pdf)

Abstract: Scientometric indicators are treated according to dimensional approaches. One, two, three, dimensions and multidimensional characteristics are revealed graphically for giving a panoramic view on the publication activity and citation impact of different countries.

Keywords: Activity, Characteristics, Citation, Citation Impact, Eighties, Impact, Indicator, Indicators, Life, National Performances, Publication, Publication Output, Science

Van Raan, A.F.J. (1997), Scientometrics: State-of-the-art. *Scientometrics*, **38** (1), 205-218.

Full Text: [1997\Scientometrics38, 205.pdf](1997/Scientometrics38,%20205.pdf)

Abstract: In this presentation we argue that the core research activities of scientometrics fall in four interrelated areas: science and technology indicators, information systems on science and technology, the interaction between science and technology, and cognitive as well as socio-organisational structures in science and technology.

Keywords: Academic, Applications, Balance, Climate, Community, Condition, Core, Development, Driving, Environment, Fall, Indicators, Information, Interaction, Methodology, Research, Research Performance, Science, Scientometrics

Yitzhaki, M. (1997), Variation in informativity of titles of research papers in selected humanities journals: A comparative study. *Scientometrics*, **38** (2), 219-229.

Full Text: [1997\Scientometrics38, 219.pdf](1997/Scientometrics38,%20219.pdf)

Abstract: Titles constitute the most concise statement of a document’s content, and are heavily used by information retrieval systems. Consequently, the great importance of titles being highly informative is indisputable. The most common measure of title ‘informativity’ has been the number of ‘substantive’ words it includes. Previous studies found significant differences between journals of different subject fields, in the sciences and the social sciences, regarding the number of substantive words in article titles. However, unlike the sciences and the social sciences, very little research has been done on *humanities* journals. Examining title informativity in a group of eighteen leading English-language journals, covering various humanities disciplines, from 1940 to 1990, the present study searched for possible differences between the humanities journals and the scientific and social sciences ones, concerning patterns of title informativity. Generally, considerable differences were found in the number of substantive words in article titles between the various humanities journals checked. On the other hand, a comparison of the *group-average* means and medians of the humanities journals to group figures of journals from the sciences and the social sciences indicates significant differences for almost all decade years studied. However, titles of papers in humanities journals did follow the general trend of increase in informativity, although in a slower pace. Possible explanations of these differences are discussed and areas for further study are suggested.

Keywords: Article, Comparative Study, Comparison, General, Group, Hand, Importance, Information, Information Retrieval, Research, Sciences, Social, Social Sciences, Trend

van Dalen, H.P. (1997), Measuring giants and dwarfs: Assessing the quality of economists. *Scientometrics*, **38** (2), 231-252.

Full Text: [1997\Scientometrics38, 231.pdf](1997/Scientometrics38,%20231.pdf)

Abstract: The emergence of ideas in economic science is dominated by scientists situated in the US. The brain drain to thee US after de Second World War gave economic scientists who stayed behind a chance to obtain a monopoly position in determining the development of economics in their home country. These facts are illustrated by a citations study of economic science in the Netherlands. Especially one man, the Nobel laureate Jan Tinbergen, has left an indelible mark on the way Dutch economic science has developed. The development of Dutch economics shows strong path-dependence.

Keywords: American, Brain, Citations, Development, Economic, Economics, Emergence, Europe, Home, Position, Quality, Science, US

Vogel, E.E. (1997), Impact factor and international collaboration in Chilean physics: 1987-1994. *Scientometrics*, **38** (2), 253-263.

Full Text: [1997\Scientometrics38, 253.pdf](1997/Scientometrics38,%20253.pdf)

Abstract: The 598 papers on physics published between 1987 and 1994 with at least one author presenting Chilean affiliation are scrutinized. Several aspects are cross-examined along the period of eight years: number of papers, cumulative impact factor, average impact factor, international co-authorship, most visited journals and main Chilean institutions. It is found that physics is growing in Chile with international collaboration playing an important role. The average impact factor is relatively high and rather constant throughout the period reflecting that the good level of Chilean physics is stable. The articles spread in 165 different journals, but most of the productivity is to be found in a few journals of high impact factor. Most of the research is done by institutions in Santiago but other emerging institutions are also identified.

Keywords: Chile, Citation Impact, Co-Authorship, Collaboration, Cumulative Impact, Eighties, Impact, Impact Factor, Institutions, International Collaboration, National Performances, Productivity, Publication Output, Research, Role, World Science

Notes: UUniversity

Ugolini, D., Parodi, S. and Santi, L. (1997), Analysis of publication quality in a cancer research institute. *Scientometrics*, **38** (2), 265-274.

Full Text: [1997\Scientometrics38, 265.pdf](1997/Scientometrics38,%20265.pdf)

Abstract: The paper presents an experimental method for the evaluation of scientific papers in the field of oncology and related disciplines developed at the National Institute for Cancer Research (IST), Genoa, Italy. The method is based on the partitioning of categories of the *Science Citation Index-Journal Citation Reports* (SCI-JCR) into deciles, thus normalizing Impact Factor (IF), in order to guage the quality of the productivity. A second parameter related to the number of staff of each department co-authoring a given paper has been introduced for the allocation of Institute funding. The following studies have been carried to compare the assigned score and the average number of citations of papers published by a research group. The identification of correctives is in progress. The method provides a basis for a possible method to judge the quality of publications from within a research organization, and should be reproducible independently of the disciplines considered.

Keywords: Allocation, Cancer, Citations, Evaluation, Experimental, Funding, Group, Identification, Indicators, Italy, Oncology, Order, Paper, Partitioning, Productivity, Publication, Publications, Quality, Research

? Small, H. (1997), Update on science mapping: Creating large document spaces. *Scientometrics*, **38** (2), 275-293.

Full Text: [1997\Scientometrics38, 275.pdf](1997/Scientometrics38,%20275.pdf)

Abstract: Science mapping projects have been revived by the advent of virtual reality software capable of navigating large synthetic three dimensional spaces. Unlike the earlier mapping efforts aimed al creating simple maps at either a global or local level, the focus is now on creating large scale maps displaying many thousands of documents which can be input into :he new VR systems. This paper presents a general framework for creating large scale document spaces as well as some new methods which perform some of the individual processing steps. The methods are designed primarily for citation data but could be applied to other types of data, including hypertext links.

Keywords: Citation, General, Global, Local, Mapping, Methods, Paper, Processing, Scale, Science, Scientific Literatures, Software, Synthetic, Three-Dimensional, Virtual Reality, VR

Notes: CCountry

Macías-Chapula, C.A. and Rodea-Castro, I.P. (1996), Subject content of the Mexican production on health and the environment (1982-1993). *Scientometrics*, **38** (2), 295-308.

Full Text: [1997\Scientometrics38, 295.pdf](1997/Scientometrics38,%20295.pdf)

Abstract: This work reports on the subject content analysis performed to 1323 records retrieved from international databases, related to the Mexican production on environmental health. The U.S. National Library of Medicine’s Medical Subject Headings (MeSH) and BIREME’s Health Sciences Descriptors (DeCS) were used as guiding tools to select the subject content of records. Overall, 97 descriptors were identified, 65 corresponded to MeSH terms and 32 were generated by the authors. Results indicated that most of the production was related to environmental pollution studies focused on water and air pollution, and environmental monitoring. Through the development of hierarchical models, patterns of subjects covered and uncovered could be easily identified. Further lines of action and research are proposed by the authors.

Keywords: Air, Air Pollution, Analysis, Content Analysis, Databases, Development, Environment, Environmental, Environmental Health, Environmental Monitoring, Environmental Pollution, Health, Information, Models, Monitoring, Pollution, Production, Research, Tools, Water

Zhang, H.Q. and Guo, H. (1997), Scientific research collaboration in China. *Scientometrics*, **38** (2), 309-319.

Full Text: [1997\Scientometrics38, 309.pdf](1997/Scientometrics38,%20309.pdf)

Abstract: The purpose of this study is to analyze the characteristics of scientific research collaboration in China by bibliometric indicators, collaborative index, degree of collaboration and level of collaboration, based on the articles published in 1218 titles of Chinese scientific and technical periodicals in the year 1993. The results suggest that the current trend of collaboration among multiauthors and multiinstitutions for producing scientific articles may have reflected the multidimensional science of China.

Keywords: Bibliometric, Bibliometric Indicators, Characteristics, China, Chinese, Co-Authorship, Collaboration, Cooperation, Current, Index, Indicators, International Collaboration, Journals, Multiple Authorship, Output, Patterns, Periodicals, Research, Research Collaboration, Science, Sciences, Trend

Notes: TTopic

Braun, T., Schubert, A. and Zsindely, S. (1997), Nanoscience and nanotechnology on the balance. *Scientometrics*, **38** (2), 321-325.

Full Text: [1997\Scientometrics38, 321.pdf](1997/Scientometrics38,%20321.pdf)

Abstract: A number of advantages of nanostructured materials over bulk materials and their potential applications in many scientific and technological fields have been revealed in recent years. To find out the main growth and trends of this exciting new science and technology fields the growth rate of the nano-prefixed terms in the title of journal papers has been measured. It has been shown that the investigations dealing with graphite nanotubes represent kinetically the most active field of research in the nanosciences.

Keywords: Applications, Balance, Graphite, Growth, Growth Rate, Investigations, Journal, Materials, Nanosciences, Nanotechnology, Recent, Research, Science, Trends

? (1997), Cumulative indexes for volumes 26-35. *Scientometrics*, **38** (3), 327-422

Full Text: Scientometrics38, 327

? Romanov, A.K. and Terekhov, A.I. (1997), The mathematical model of productivity- and age-structured scientific community evolution. *Scientometrics*, **39** (1), 3-17.

Full Text: [1997\Scientometrics39, 3.pdf](1997/Scientometrics39,%203.pdf)

Abstract: The productivity factor is very important at the mathematical simulation of scientific community evolution. In Ref. 1 the productivity index has been incorporated into the model exogenously to formulate the criterion of dynamic optimization of the scientific community age structure. In this paper we are going to include the productivity (as well as the age) in the individual state space and to derive the main dynamic equation which takes into account the stochastic fluctuations of scientific community members’ productivity and some modifications of the Fokker-Planck equation. An approximation method for the evolution model is suggested with the aid of which the computational experiment is carried out. The discussion of experimental results and possible ways for improvement and extension of model are presented.

Keywords: Age, Community, Computational, Dynamic, Evolution, Experiment, Experimental, Fokker Planck Equation, Index, Mathematical Model, Model, Optimization, Paper, Productivity, Simulation, Stochastic, Structure

Cunningham, S.J. and Dillon, S.M. (1997), Authorship patterns in information systems. *Scientometrics*, **39** (1), 19-27.

Full Text: [1997\Scientometrics39, 19.pdf](1997/Scientometrics39,%2019.pdf)

Abstract: This paper examines the patterns of multiple authorship in five information systems journals. Specifically, we determine the distribution of the number of authors per paper in this field, the proportion of male and female authors, gender composition of research teams, and the incidence of collaborative relationships spanning institutional affiliations and across different geographic regions.

Keywords: Authorship, Composition, Distribution, Female, Gender, Incidence, Information, Journals, Male, Paper, Research, Scientific Collaboration

Keywords: Access, Analysis, Bibliometric, Bibliometric Methods, Characteristics, Crisis, Information, Internet, Methods, Paper

Bar-Ilan, J. (1997), The ‘mad cow disease’, usenet newsgroups and bibliometric laws. *Scientometrics*, **39** (1), 29-55.

Full Text: [1997\Scientometrics39, 29.pdf](1997/Scientometrics39,%2029.pdf)

Abstract: In this paper the reactions of Usenet News users’ to ‘mad cow disease’ is examined. Thousands of newsgroups on an extremely wide variety of subjects exist, and anyone, having access to the Internet, can express his/her thoughts freely on this medium. We collected information on the news items relevant to ‘mad cow disease’ for a period of one hundred days starting very close to the eruption of the crisis. The analysis of the collected information reveals some similarities between the bibliometric characteristics of news items on an electronic medium and the physically printed scientific literature. As far as we know, this is one of the first attempts to systematically apply bibliometric methods to the Internet.

Notes: CCountry

Goldberg, A.I., Oigenblick, L. and Rubin, A.H.E. (1997), Scientific articles and national medical cultures: A comparison of Russian and American medical journals. *Scientometrics*, **39** (1), 57-75.

Full Text: [1997\Scientometrics39, 57.pdf](1997/Scientometrics39,%2057.pdf)

Abstract: Medical journals are products of national medical cultures, which influence the organization of medical research and the readiness to employ different research methodologies. A content analysis was undertaken to ascertain the characteristics of scientific papers in nine Russian and three American medical journals published in 1992. The American medical journals were thriving, both in appearance, and with research contributions coming from a decentralized national system of research institutions and also from European and other international research centers. Much of American medical research is ‘big science’ based on collaborative efforts of researchers at a number of institutions. Russian medical journals, in contrast, were more parochial in content, reporting mainly local research, with several primary journals serving as outlets for endeavors of sponsoring institutes. While Russian medical culture did appear to discourage usage of classical random experimental designs, the choice of research methodologies proved to be influenced more by medical specialization than by national culture.

Keywords: Analysis, Appearance, Characteristics, Citation Analysis, Collaboration, Comparison, Content Analysis, Culture, Experimental, Health-Care, Institutions, Life Sciences, Local, Medical, Medical Journals, Products, Reporting, Research, Soviet Science

? Spasser, M.A. (1997), Mapping the terrain of pharmacy: Co-classification analysis of the International Pharmaceutical Abstracts database. *Scientometrics*, **39** (1), 77-97.

Full Text: [1997\Scientometrics39, 77.pdf](1997/Scientometrics39,%2077.pdf)

Abstract: This research uses descriptive multivariate data-analytic techniques - in particular, multidimensional scaling and hierarchical cluster analysis - to explore and visualize the structure of the pharmacy literature as refracted through the editorial policies of the International Pharmaceutical Abstracts (IPA) database. Specifically, the co-occurrence of the section headings/codes, used to exhaustively categorize publications in the IPA database, are clustered and mapped to evaluate the usefulness of two methods of section heading assignment. A secondary purpose of this research is to evaluate the use of descriptive multivariate data-analytic techniques and co-classification analysis to explore and depict the structure of an inherently heterogeneous and multidisciplinary professional literature, such as pharmacy.

Keywords: Analysis, Biotechnology, Cluster, Cluster Analysis, Combined Cocitation, Editorial Policies, Heterogeneous, Hierarchical Cluster Analysis, Methods, Multidisciplinary, Multivariate, Publications, Research, Research-And-Development, Scaling, Science, Structure, Techniques, Word Analysis

Notes: TTopic

Bird, J.E. (1997), Authorship patterns in marine mammal science, 1985-1993. *Scientometrics*, **39** (1), 99-105.

Full Text: [1997\Scientometrics39, 99.pdf](1997/Scientometrics39,%2099.pdf)

Abstract: Authorship studies in such disciplines as physics and economics show that with the passage of time there has been an increase in the number of authors per paper, indicating a trend toward more collaboration. In this study, a search was run on the Aquatic Sciences and Fisheries Abstracts database to identify marine mammal science papers published from 1985 to 1993. A total of 1308 papers published in scientific journals was examined. There were weak but statistically significant trends in the increase in the number of authors per paper as well as in the number of multi-authored papers written by authors from different institutions, with the passage of time. Possible reasons for these results include the increasing specialization of researchers necessitating collaboration, more access to electronic means of communication, and more competition for research funds. Confounding factors in this analysis include the possibility that different journals have different publication patterns and regional vs. national/international journal differences.

Keywords: Access, Analysis, Collaboration, Communication, Competition, Economics, Institutions, Journal, Journals, Mammal, Marine, Marine Mammal, Multiple Authorship, Paper, Publication, Regional, Research, Science, Trend, Trends

Notes: TTopic

Schummer, J. (1997), Scientometric studies on chemistry I: The exponential growth of chemical substances, 1800-1995. *Scientometrics*, **39** (1), 107-123.

Full Text: [1997\Scientometrics39, 107.pdf](1997/Scientometrics39,%20107.pdf)

Abstract: The number of chemical substances is considered as a cumulative measure of the cognitive growth of preparative chemistry. During the past 200 years there is approximately exponential growth without saturation. Separate analysis of organic and inorganic chemistry suggests at least a two-phase model either. Detailed discussion of the results (considering also the growth of chemists, chemical papers, patents, and chemical elements) reveals that an external (socio-economical) explanation is insufficient. Instead, an internal (methodological) approach is suggested to explain the exponential growth as well as balancing phenomena in war and post-war times.

Keywords: Analysis, Chemical, Chemical Elements, Elements, Growth, Inorganic, Model, Organic, Patents, Saturation, War

Notes: TTopic

Schummer, J. (1997), Scientometric studies on chemistry II: Aims and methods of producing new chemical substances. *Scientometrics*, **39** (1), 125-140.

Full Text: [1997\Scientometrics39, 125.pdf](1997/Scientometrics39,%20125.pdf)

Abstract: Chemistry, as today’s most active science, has increased its substances exponentially during the past 200 years without saturation. To get more insight why and how chemists produce new substances, a content analysis of 300 communications to the *Angewandte Chemie* of the years 1980, 1990, and 1995 is carried out regarding aims and methods of preparative research. In the most productive field of organic chemistry production mainly occurs to improve abilities for further production, while the less productive field of inorganic chemistry has more diverse aims. Methodological differences between organic and inorganic chemistry are discussed in detail as well as the relationship between pure and applied science.

Keywords: Analysis, Chemical, Content Analysis, Inorganic, Methods, Organic, Organic Chemistry, Production, Research, Saturation, Science

Oppenheim, C. (1997), Patent citation analysis. *Scientometrics*, **39** (1), 141.

Full Text: [1997\Scientometrics39, 141.pdf](1997/Scientometrics39,%20141.pdf)

Keywords: Analysis, Citation, Citation Analysis

? (1997), In memoriam of Vassily Vassiliyevich Nalimov, 1910-1997. *Scientometrics*, **39** (2), 143-145

Full Text: [1997\Scientometrics39, 143.pdf](1997/Scientometrics39,%20143.pdf)

Budilova, E.V., Drogalina, J.A. and Teriokhin, A.T. (1997), Principal trends in modern ecology and its mathematical tools: An analysis of publications. *Scientometrics*, **39** (2), 147-157.

Full Text: [1997\Scientometrics39, 147.pdf](1997/Scientometrics39,%20147.pdf)

Abstract: The paper deals with a scientometric analysis of publications from the journals ‘Ecology’ and ‘Ecologia’ (Russia) based on the frequencies of individual and cojoint encountering of ecological and mathematical keywords in these publications. Two main research approaches are revealed: population ecology and system ecology. The first one is used primarily in studies of plant communities, while the other in terrestrial animals and birds. Water communities are the subject of both approaches. The most spread mathematical methods are the methods of mathematical statistics which can be clustered into four groups: standard ones, multivariate methods, in particular multiple regression and multivariate analysis of variance, nonparametric or allowing deviations from normality, and methods of analysis of categorical data. Differential equations and stochastic process are used much lesser. The intensities of using mathematical methods are notably different in two journals.

Keywords: Analysis, Birds, Communities, Ecology, Equations, Groups, Methods, Multiple Regression, Multivariate, Multivariate Analysis, Paper, Plant, Plant Communities, Population, Process, Publications, Regression, Research, Russia, Standard, Statistics, Stochastic, Terrestrial, Tools, Trends

? Fonseca, L., Velloso, S., Wofchuk, S. and DeMeis, L. (1997), The importance of human relationships in scientific productivity. *Scientometrics*, **39** (2), 159-171.

Full Text: [1997\Scientometrics39, 159.pdf](1997/Scientometrics39,%20159.pdf)

Abstract: Fifty Brazilian scientists working in life sciences were interviewed in order to explore reasons of bursts and falls in their scientific productivity. Scientists recognize specific periods of time of their career during which they are more productive. Bursts of productivity are influenced mainly by human relationships and, to a lower extent, by material conditions (equipment, grants, etc), time dedicated to work and reasons linked to the kind of work carried out. The most productive scientists tend to attribute more importance to human relations than their colleagues with lower productivity scores. Some possible reasons for this discrepancy are discussed.

Keywords: Falls, Human, Importance, Life, Order, Productivity, Sciences, Scientific Productivity

Avkiran, N.K. (1997), Scientific collaboration in finance does not lead to better quality research. *Scientometrics*, **39** (2), 173-184.

Full Text: [1997\Scientometrics39, 173.pdf](1997/Scientometrics39,%20173.pdf)

Abstract: The study reports an empirical comparison of quality of collaborative research with the quality of individual research. Quality of a paper is measured by the citation rate over the four years following the year of publication. papers published in fourteen Finance journals between 1987-1991 are sampled. There is no significant difference between the quality of collaborative and individual research. Decision-makers should hesitate in interpreting collaborative research as a definitive sign of ability to produce better research.

Keywords: Authorship, Citation, Collaboration, Comparison, Lead, Paper, Productivity, Psychology, Publication, Quality, Research, Single

Notes: CCountry

Sikka, P. (1997), Statistical profile of science and technology in India and Brazil. *Scientometrics*, **39** (2), 185-195.

Full Text: [1997\Scientometrics39, 185.pdf](1997/Scientometrics39,%20185.pdf)

Abstract: By making comparison of the science indicators, the author has critically examined the development of science and technology (S&T) in India and Brazil. The SWOT analysis indicate that, with the support of federal government, both of these developing countries have built capacities and capabilities in many areas of S&T towards attaining self-reliance and have developed potential to excel in the world-market and face challenges thereof. India and Brazil are continuing to make efforts for attaining the transition from a developing to a developed country and reviewing S&T policies towards achieving industrial competitiveness.

Keywords: Analysis, Brazil, Comparison, Developing Countries, Development, India, Indicators, Industrial, Profile, Science, Support

Notes: CCountry

de Haan, J. (1997), Authorship patterns in Dutch sociology. *Scientometrics*, **39** (2), 197-208.

Full Text: [1997\Scientometrics39, 197.pdf](1997/Scientometrics39,%20197.pdf)

Abstract: This article looks at authorship patterns in Dutch sociology from 1939 to 1987. Results from co-author analysis show an increase in collaboration. Yet, most publications are still written by single authors. Network analysis of co-author relations for two seven year intervals and one six year interval distinguished 37 clusters with three or more members. Most clusters could be identified by experts. However, the clusters only partially matched their perception of research networks within Dutch sociology.

Keywords: Analysis, Authorship, Clusters, Collaboration, Perception, Publications, Research

Notes: CCountry

Persson, O., Melin, G., Danell, R. and Kaloudis, A. (1997), Research collaboration at Nordic universities. *Scientometrics*, **39** (2), 209-223.

Full Text: [1997\Scientometrics39, 209.pdf](1997/Scientometrics39,%20209.pdf)

Abstract: Scientific collaboration has become a major issue in science policy. The need to survey and follow up such collaboration calls for statistical indicators sensitive enough to reveal the structure and change of collaborative networks. Bibliometric analysis of co-authored scientific articles is one promising approach. This study presents data generated from a comprehensive analysis of some 20,000 articles produced by 22 Nordic universities (Denmark, Finland, Iceland, Norway, Sweden) in 1993. The results show that scientific collaboration plays a key role for all universities, and that they collaborate with external institutions in just about the same extent. The inter-Nordic university network comprises about ten percent of all institutional collaborations. However, the amount of collaboration varies across fields, physics and medicine having a high degree of collaboration. The inter-Nordic network is of equal importance as the national network in physics and geosciences. Especially, when one looks at international collaboration outside the Nordic arena, the number of overlapping partners is quite low. This suggests that research specialization is the major force governing international contacts.

Keywords: Analysis, Collaboration, Denmark, Finland, Follow up, Follow-up, Importance, Indicators, Institutions, International Collaboration, Key, Low, Norway, Policy, Research, Role, Science, Science Policy, Science-Policy, Scientific Collaboration, Structure, Survey, Sweden, Universities

? Kostoff, R.N. (1997), Citation analysis cross-field normalization: A new paradigm. *Scientometrics*, **39** (3), 225-230.

Full Text: [1997\Scientometrics39, 225.pdf](1997/Scientometrics39,%20225.pdf)

Abstract: A new paradigm for comparing quality of published papers across different disciplines has been proposed. This method uses a figure of merit of the ratio of actual citations received to the potential maximum number of citations that could have been received. It is analogous to approaches used to compare performance in physical systems, and appears intrinsically more useful than present approaches.

Keywords: Analysis, Citations, Performance, Physical, Quality

? WagnerDobler, R. (1997), Time dependencies of Bradford distributions: Structures of journal output in 20th-century logic and 19th-century mathematics. *Scientometrics*, **39** (3), 231-252.

Full Text: [1997\Scientometrics39, 231.pdf](1997/Scientometrics39,%20231.pdf)

Abstract: Time dependencies of Bradford distributions are investigated for 19th-century mathematics and for 20th-century logic. To facilitate comparisons, for the representation of empirical Bradford distributions “ Pareto’s law “ and Lorenz diagrams are used. It is shown that the character of a Bradford distribution (including the “ core zone “ and the “ Groos droop “) depends on the stage in the development of a scientific field and that it varies with the time-span considered.

Keywords: Core, Development, Distribution, Distributions, Index, Journal, Law, Lorenz, Output, Representation

Osareh, F. and Wilson, C.S. (1997), Third World Countries (TWC) research publications by disciplines: A country-by-country citation analysis. *Scientometrics*, **39** (3), 253-266.

Full Text: [1997\Scientometrics39, 253.pdf](1997/Scientometrics39,%20253.pdf)

Abstract: This paper discusses the publications of Third World Countries (TWC) in the Science Citation Index by disciplines. TWC documents which were nationally cross-linked at least 20 times were identified and their citing documents categorised into seven disciplines. The top 12 TWC are discussed vis-a-vis their population, Gross National Product, and the extent of participation using observed rates of contribution in each discipline and expected rates based on numbers of citations received. Brazil, Mexico, Argentina and Chile, appeared most frequently in the top five ranks in each of the seven disciplines, however, none of these countries had neither the largest population nor the highest GNP per capita. Overall observed rates exceeded expected rates in all but two disciplines: Biomedicine and Agriculture. Physics? Engineering had the highest overall observed rate with the top five TWC exceeding the overall and their individual expected rates. Brazil and Venezuela led by exceeding their expected rates in four of the seven disciplines.

Keywords: Analysis, Argentina, Brazil, Chile, Citation, Citation Analysis, Citations, Crosslinked, Journals, Mexico, Paper, Participation, Periphery, Population, Publications, Research, Science, Science Citation Index, Venezuela

? DeLooze, M.A. and Lemarie, J. (1997), Corpus relevance through co-word analysis: An application to plant proteins. *Scientometrics*, **39** (3), 267-280.

Full Text: [1997\Scientometrics39, 267.pdf](1997/Scientometrics39,%20267.pdf)

Abstract: Different corpuses are analysed by means of co-word analysis, in the framework of technological watch of the industrial valorization of plant proteins. The comparison of keyword clusters reveals unequal results, raising the question of the relevance of information retrieval. The corpuses compiled do not provide ail the important signals that can be expected from this type of study. Research on several data bases (five) provides increasingly detailed images which allow for rapid progress, with the experts, towards critical points of information.

Keywords: Analysis, Clusters, Co-Word Analysis, Comparison, Industrial, Information, Information Retrieval, Leximappe, Plant, Proteins

Gupta, B.M. and Karisiddappa, C.R. (1997), Productivity of authors as reflected by duration of their scientific participation and speed of publication. *Scientometrics*, **39** (3), 281-291.

Full Text: [1997\Scientometrics39, 281.pdf](1997/Scientometrics39,%20281.pdf)

Abstract: The paper analyses the frequency distribution of scientific productivity of authors active for same length of time in theoretical population genetics speciality. The focus of analysis is on two aspects: their actual duration of participation in total research output and the speed at which they are able to produce their research publications.

Keywords: Analysis, Distribution, Genetics, Output, Paper, Participation, Population, Productivity, Publication, Publications, Research, Scientific Productivity, Speed

Gupta, B.M., Kumar, S. and Karisiddappa, C.R. (1997), Collaboration profile of theoretical population genetics speciality. *Scientometrics*, **39** (3), 293-314.

Full Text: [1997\Scientometrics39, 293.pdf](1997/Scientometrics39,%20293.pdf)

Abstract: Traces the growth of collaborated and funded research as reflected in research papers in theoretical population genetics research speciality from 1916-80 through a case study. Analyses the proportion and extent of collaborated papers, averge number of authorship per paper, and collaborative coefficient index of research papers thereby giving an overall perspective of the growth of professionalism in the field. Studies the relation between collaboration, productivity, and funding of research papers in theoretical population genetics. Classifies the total collaborative papers/authors by type of collaboration and studies the trends and shifts in the nature and type of collaborative research over the years.

Keywords: Authorship, Case Study, Collaboration, Funding, Genetics, Growth, Index, Paper, Population, Productivity, Professionalism, Profile, Research, Sciences, Scientific Co-Authorship, Trends

Zumelzu, E. (1997), Mainstream engineering publishing in Latin America: The Chilean experience. *Scientometrics*, **40** (1), 3-12.

Full Text: [1997\Scientometrics40, 3.pdf](1997/Scientometrics40,%203.pdf)

Abstract: An analysis was made using databases at the Institute for Scientific Information (ISI) in Philadelphia concerning the productivity in the field of engineering sciences in Chile, a developing country with a neoliberal economy which has mainstream articles related to the Latin American context. This paper also mentions policies and actions to be adopted in order to strengthen R&D activities to attain a higher scientific and technological progress.

Keywords: Analysis, Chile, Databases, Economy, Engineering, Institute for Scientific Information, ISI, Latin America, Made, Order, Paper, Philadelphia, Productivity, Publishing, Science, Sciences

Todorovsky, D. (1997), On the working time budget of the university teacher. *Scientometrics*, **40** (1), 13-21.

Full Text: [1997\Scientometrics40, 13.pdf](1997/Scientometrics40,%2013.pdf)

Abstract: Results of a self-observation of the working time distribution of an university teacher for a period of 28 years are reported. Averaged over the whole period, the teaching activities take 18%, scientific work −20%, and the various kinds of administrative, organizational and technical activities −51% of the working time. The changes of the working time distribution and of the working day duration during the years and the respective data related to the months in the year are presented. The working time data are compared with the growth of the scientific production of the observed person.

Keywords: Budget, Distribution, Growth, Organizational, Production, Scientific Production, Teaching

Anwar, M.A. and Abu Bakar, A.B. (1997), Current state of science and technology in the Muslim world. *Scientometrics*, **40** (1), 23-44.

Full Text: [1997\Scientometrics40, 23.pdf](1997/Scientometrics40,%2023.pdf)

Abstract: Reviews the current state of science and technology in the Muslim world in the light of the CASTASIA 1968 and the International Conference on Science in Islamic Polity 1983 recommendations of allocating 1.0 percent of GNP for R&D. The data presented indicates that the Muslim countries have not been able to achieve this target. OIC countries on the average spend 0.45 percent of their GNP on R&D as compared to 2.30 percent by OECD countries. Egypt which leads the Muslim countries spends 0.86 percent of its GNP on R&D as compared to 2.27 percent by Israel. Indonesia spends 0.17 percent as compared to 1.78 percent by Taiwan. Annual growth of R&D expenditure in a few Muslim countries, especially Turkey and Malaysia, is very encouraging. Muslims are also far behind in terms of R&D manpower. OIC countries have 8.5 scientists, engineers and technicians per 1,000 population as compared to 40.7 of world average and 139.3 for OECD countries. The contribution of Muslim countries to world science literature is also meagre. Forty-six Muslim countries contribute 1.17 percent to world science literature as compared to 1.66 percent by India and 1.48 percent by Spain. Twenty Arab countries contribute 0.55 percent as compared to 0.89 percent by Israel alone. Contribution to science literature is also analyzed on the basis of total population, literate population, and GNP per capita. Growth of science literature in many Muslim countries is faster than OECD countries.

Keywords: Current, Egypt, Growth, India, Indonesia, Israel, Light, Malaysia, Population, Recommendations, Science, Spain, Taiwan, Turkey

Rousseau, S. and Rousseau, R. (1997), Data envelopment analysis as a tool for constructing scientometric indicators. *Scientometrics*, **40** (1), 45-56.

Full Text: [1997\Scientometrics40, 45.pdf](1997/Scientometrics40,%2045.pdf)

Abstract: It is shown that Data Envelopment Analysis (DEA) can be used to construct relative scientific and technological indicators. The method is explained and illustrated using countries as objects of study, GDP, active population and R&D expenditure as inputs, and publications and patents as outputs. Using these parameters the efficiency of countries is assessed.

Keywords: Efficiency, GDP, Government-Sponsored Research, Indicators, Inputs, Parameters, Patents, Performance-Measures, Population, Publications

? Bhattacharya, S., Singh, S.P. and Sudhakar, P. (1997), Tracking changes in research priorities in Physics: A macro level analysis. *Scientometrics*, **40** (1), 57-82.

Full Text: [1997\Scientometrics40, 57.pdf](1997/Scientometrics40,%2057.pdf)

Abstract: This paper attempts to monitor the changes in research priorities in Physics by analyzing the research profile of thirty three countries in major fields of Physics as classified under PACS (Physics and Astronomy Classification scheme). Data is taken from INSPEC (CD-ROM) version under two different time periods - 1990 & 1995. Priority Index (PI) is used to understand the priorities of countries in major fields and shifts in their priorities during these two time periods. Correspondence analysis is applied to the matrices of research priorities to understand the multivariate relationships between countries and fields and reveal the dynamics of changes taking place in two time periods. The results and its implications for policy studies are discussed.

Keywords: Analysis, CD-ROM, Dynamics, Multivariate, PAC, Paper, Policy, Profile, Research

? Rotto, E. and Morgan, R.P. (1997), An exploration of expert-based text analysis techniques for assessing industrial relevance in US engineering dissertation abstracts. *Scientometrics*, **40** (1), 83-102.

Full Text: [1997\Scientometrics40, 83.pdf](1997/Scientometrics40,%2083.pdf)

Abstract: This paper describes exploratory research on the application of computerized text analysis techniques to all U.S. engineering doctoral dissertation abstracts dated 1981, 1986, and 1991. Experts were utilized to categorize abstracts by industrial relevance, and to identify appropriate non-technology-specific word indicators within the abstracts. Word frequency and cluster analysis techniques were also explored for their potential utility in identifying technology-related word indicators of industrial relevance. The results of this work suggest that text analysis of engineering dissertation abstracts holds potential utility for identifying industrially relevant university-based engineering research, when used in conjunction with expert input and feedback.

Keywords: Analysis, Cluster, Cluster Analysis, Engineering, Exploration, Feedback, Indicators, Industrial, Paper, Representations, Research, Science Maps, Techniques, US, Utility

? Kostoff, R.N., Eberhart, H.J., Toothman, D.R. and Pellenbarg, R. (1997), Database Tomography for technical intelligence: Comparative roadmaps of the research impact assessment literature and the journal of the American Chemical Society. *Scientometrics*, **40** (1), 103-138.

Full Text: [1997\Scientometrics40, 103.pdf](1997/Scientometrics40,%20103.pdf)

Abstract: This paper shows how Database Tomography can be used to derive technical intelligence From the published literature. Database Tomography is a patented system for analyzing large amounts of textual computerized material. It includes algorithms for extracting multi-word phrase frequencies and performing phrase proximity analyses. Phrase frequency analysis provides the pervasive themes of a database, and the phrase proximity analysis provides the relationships among the pervasive themes, and between the pervasive themes and sub-themes. One potential application of Database Tomography is to obtain the thrusts and interrelationships of a technical field from papers published in the literature within that field. This paper provides applications of Database Tomography to analyses of both the non-technical field of Research Impact Assessment (RIA) and the technical field of Chemistry. A database of relevant RIA articles was analyzed to produce characteristics and key features of the RIA field. The recent prolific RIA authors, the journals prolific in RIA papers, the prolific institutions in RIA, the prolific keywords specified by the authors, and the authors whose works are cited most prolifically as well as the particular papers/journals/institutions cited most prolifically, are identified. The pervasive themes of RIA are identified through multi-word phrase analyses of the database. A phrase proximity analysis of the database shows the relationships among the pervasive themes, and the relationships between the pervasive themes and subthemes. A similar process was applied to Chemistry, with the exception that the database was limited to one year’s issues of the Journal of the American Chemical Society. Wherever possible, the RIA and Chemistry results were compared. Finally, the conceptual use of Database Tomography to help identify promising research directions was discussed.

Keywords: Algorithms, Analysis, Applications, Assessment, Characteristics, Features, Impact, Impact Assessment, Institutions, Journal, Key, Paper, Process, Recent, Research

? Gupta, B.M. (1997), Analysis of distribution of the age of citations in theoretical population genetics. *Scientometrics*, **40** (1), 139-162.

Full Text: [1997\Scientometrics40, 139.pdf](1997/Scientometrics40,%20139.pdf)

Abstract: Analyses the age of references cited in source papers of the theoretical population genetics speciality at different phases bf its development. Discusses the characteristics of specialities in terms of obsolescence measures such as half-life and immediacy index. Explores the applicability of different theoretical probability functions in the age densities of references cited. Concludes that age of references cited is best modelled according to lognormal distribution.

Keywords: Age, Characteristics, Citations, Densities, Development, Distribution, Genetics, Half-Life, Immediacy Index, Index, Population, Probability, Source

Vinkler, P. (1997), Relations of relative scientometric impact indicators. The relative publication strategy index. *Scientometrics*, **40** (1), 163-169.

Full Text: [1997\Scientometrics40, 163.pdf](1997/Scientometrics40,%20163.pdf)

Abstract: Relations of three relative scientometric indicators (Relative Citation Rate, RCR, Relative Subfield Citedness, R-W, and Relative Publication Strategy, RPS) are studied. R-W can be calculated by the percentage share of citations divided by that of publications. The findings indicate that publishing in journals with relatively high impact factor is a necessary but not sufficient condition for attaining a high R-W index.

Keywords: 27 Science Areas, 50 Nations, Bradford Law, Citations, Condition, Impact, Impact Factor, Index, Indicators, Publication, Publications, Publishing, Strategy, Weight

Davidse, R.J. and Vanraan, A.F.J. (1997), Out of particles: Impact of CERN, DESY and SLAC research to fields other than physics. *Scientometrics*, **40** (2), 171-193.

Full Text: [1997\Scientometrics40, 171.pdf](1997/Scientometrics40,%20171.pdf)

Abstract: This paper presents the results of an exploratory bibliometric study aiming at an analysis of basic high energy physics (HEP) research impact on fields other than physics, and particularly on application-oriented R&D. After a general discussion of an extensive citation analysis of basic research publications from three HEP institutes - CERN, DESY, and SLAG - the paper focuses on the ‘knowledge flow’ from physics to non-physics, and more specifically the flow from basic physics research to the ‘applied world’. At this level, we report journal-as well as research field characteristics, and we identify the most frequently citing R&D groups. We conclude that DESY is most cited by the ‘applied world’, followed by SLAG and CERN. if the number of journals that institutes have in common - whether based on the source or the citing publication - is taken as an indicator of the resemblance of their research interests, we found that CERN and SLAG have the closest resemblance, followed by SLAG and DESY, with CERN and DESY having the least in common

Keywords: Analysis, Basic Research, Bibliometric, Bibliometric Study, Characteristics, Citation, Citation Analysis, Core, Energy, Flow, General, Groups, Impact, Indicator, Knowledge, Paper, Particles, Publication, Publications, Research, Slag, Source

Rivas, A.L., Wilson, D.J., Gonzalez, R.N., Mohammed, H.O., Quimby, F.W., Lein, D.H., Milligan, R.A., Colle, R.D., Deshler, J.D. and Trochim, W.M.K. (1997), An interdisciplinary and systems-based evaluation of academic programs: Bovine mastitis-related veterinary research, education and outreach. *Scientometrics*, **40** (2), 195-213.

Full Text: [1997\Scientometrics40, 195.pdf](1997/Scientometrics40,%20195.pdf)

Abstract: An interdisciplinary and systems-oriented approach for evaluation of academic programs was explored in veterinary research, education and extension in the context of prevention of bovine mastitis. Bibliometric-based document analysis and observation methods were used to assess disciplinary contents of veterinary research and graduate education theses, and New York Stare dairy farmers’ adoption rate of selected veterinary recommendations (bacteriological testing of raw milk, ‘closed herds’, and three hygiene-related practices). Findings indicated that: a) the veterinary extension literature was lower in output and less differentiated in disciplinary content than that of the agricultural counterpart, b) three disciplines accounted for 58% of all theses’ major contents, and c) 39.7% of New York dairies requested bacteriological testing, 50% of investigated dairies had ‘closed herds’ and at least 9.4% of those did not adopt all the hygiene-related practices. Context-specific recommendations are proposed. It is concluded that this evaluation approach may facilitate policy analysis, program development and may be applicable to other academic settings.

Keywords: Academic, Agricultural, America, Analysis, Bovine, Colleges, Development, Education, Evaluation, Interdisciplinary, Management-Practices, Methods, Milk, New York, Observation, Output, Policy, Policy Analysis, Prevention, Program, Recommendations, Research, Testing, York

Shrum, W. (1997), View from afar: ‘visible’ productivity of scientists in the developing world. *Scientometrics*, **40** (2), 215-235.

Full Text: [1997\Scientometrics40, 215.pdf](1997/Scientometrics40,%20215.pdf)

Abstract: Much of what we know about science and technology in less developed countries comes from international databases such as bibliographies and citation indices. However, it is not clear if researchers whose work appears in international databases are representative of scientists in the developing world as a whole, or whether they differ in terms of important social characteristics. A search of international databases on agriculture and natural resource management in Ghana, Kenya, and Kerala was used to compile a bibliography that could be compared with results from a face-to-face survey of researchers. Results indicate that many of the characteristics of those who are internationally visible differ from the wider population of scientists. The implication is that the ‘view from afar’ based exclusively on information drawn from international databases does not accurately reflect the population of researchers or domestic productivity in less developed countries.

Keywords: Agriculture, Characteristics, Citation, Countries, Databases, Indicators, Information, Kenya, Kerala, Mainstream Science, Management, Natural, Output, Population, Productivity, Publication, Resource Management, Science, Social, Survey, Third-World

? Nederhof, A.J. and VanWijk, E. (1997), Mapping the social and behavioral sciences world-wide: Use of maps in portfolio analysis of national research efforts. *Scientometrics*, **40** (2), 237-276.

Full Text: [1997\Scientometrics40, 237.pdf](1997/Scientometrics40,%20237.pdf)

Abstract: We have developed a method to identify and map the internationally most visible research topics occurring in the social and behavioral sciences, as well as the topics which changed most over a decade. Methods and data relevant to a portfolio analysis of national research efforts are described. Keywords used by authors in scientific or scholarly publications provide a window on scientific developments and changes in scientific research. Using an interdisciplinary database, the SSCI, developments in publications were traced world-wide and for the US, UK, France, Germany, and the Netherlands. We compared two periods: 1981-85 and 1986-90. We discuss the major substantive developments occurring during 1981-1990, as visible in maps depicting both topics and disciplines. It is shown that the maps, enriched with scientometric indicators of strengths and weaknesses of national research efforts, can be important tools for science policy. The findings indicate that the research front on many topics in both social and behavioral sciences is international in the late 1980s.

Keywords: Analysis, Behavioral, France, Front, Germany, Humanities, Indicators, Interdisciplinary, Patterns, Policy, Psychology, Publications, Research, Research Front, Research Performance, Science, Science Policy, Science-Policy, Sciences, Social, Strengths, Tools, UK, US

Kishida, K. and Matsui, S. (1997), International publication patterns in social sciences: A quantitative analysis of the IBSS file. *Scientometrics*, **40** (2), 277-298.

Full Text: [1997\Scientometrics40, 277.pdf](1997/Scientometrics40,%20277.pdf)

Abstract: A scientometric analysis of social science literature is tried by using the machine-readable files of the *IBSS* 1981-1985. This is a comprehensive international bibliography in social sciences including cultural anthropology, economics, political science and sociology. Data used were 40, 313 monograph records in the *IBSS* files. First, the number of scholarly monographs was examined by country. As a result, it is shown that a large number of monographs was published by only a very small number of countries. Second, the number of monographs was examined by language. A similar pattern as that of countries was observed. Third, the relationship between the publishing country and the language used is discussed. It is clarified that some languages, such as English, French and Spanish, are used in many countries because of their historical background such as colonization. Finally, we examined the correlation among the number of published monographs, GDP, population and the number of people attaining a university education. A regression model that incorporates GDP as explanatory variables explains well the variation of the number of monographs by countries (R2 = 0.77).

Keywords: Analysis, Background, Colonization, Correlation, Economics, Education, GDP, Historical, Language, Languages, Model, Population, Publication, Publishing, Quantitative Analysis, Regression, Regression Model, Science, Sciences, Scientific Output, Social, Social Sciences

? Urban, D. and Hoban, T.J. (1997), Cognitive determinants of risk perceptions associated with biotechnology. *Scientometrics*, **40** (2), 299-331.

Full Text: [1997\Scientometrics40, 299.pdf](1997/Scientometrics40,%20299.pdf)

Abstract: Previous research on risk perception suggests that levels of education and information influence concerns over the effects of new technology. This article reports analysis of the impact of several cognitive factors (including education and knowledge) on the perception of risks attributed to applications of modern biotechnology (based on genetic engineering) to food production and agriculture. Using data From a 1992 US-nationwide telephone survey the statistical research identifies those cognitive factors that significantly influence risk perceptions. Additionally, the study reveals those potential influences that, despite their prominence in political and popular debates on risk communication and science education, do not determine the perception of risks on biotechnology in ally significant manner.

Keywords: Agriculture, Analysis, Applications, Biotechnology, Communication, Education, Effects, Engineering, Food, Food Production, Genetic, Genetic Engineering, Impact, Information, Knowledge, Levels, Perception, Perceptions, Production, Public-Attitudes, Research, Risk, Risk Communication, Risk Perception, Risk Perceptions, Risks, Science, Survey

? Courtial, J.P. and Gourdon, L. (1997), A scientometric approach to autism based on translation sociology. *Scientometrics*, **40** (2), 333-355.

Full Text: [1997\Scientometrics40, 333.pdf](1997/Scientometrics40,%20333.pdf)

Abstract: We advance the following hypothesis with respect to the construction of scientific knowledge: a) a scientific article may be seen as bringing together differing knowledge networks within the same experimental context, b) the researcher attempts to prove the existence of objective links within this context. This process allows the researcher to link or associate his own subjective proposals to those that are verifiably objective relationships for all researchers, Researchers consolidate the relationships put forward by others accordingly. There is a statistic method which makes it possible to demonstrate these dynamics, i.e., co-word analysis, This method, applied to articles on autism, has provided results that support this hypothesis. The methods brought to bear by the majority of researchers follow these general dynamics.

Keywords: Analysis, Autism, Co-Word Analysis, Dynamics, Experimental, General, Knowledge, Methods, Process, Support

? Small, H. (1997), Comments on Belver C. Griffith, recipient of the 1997 Derek de Solla Price Award. *Scientometrics*, **40** (3), 359-362.

Full Text: [1997\Scientometrics40, 359.pdf](1997/Scientometrics40,%20359.pdf)

? Pavitt, K. (1997), Comments on John Irvine and Ben R. Martin, recipient of the 1997 Derek de Solla Price Award. *Scientometrics*, **40** (3), 363-366.

Full Text: [1997\Scientometrics40, 363.pdf](1997/Scientometrics40,%20363.pdf)

? Peritz, B. (1997), From the opening address of the conference. *Scientometrics*, **40** (3), 367-368.

Full Text: [1997\Scientometrics40, 367.pdf](1997/Scientometrics40,%20367.pdf)

? Bookstein, A. and Wright, B. (1997), Ambiguity in measurement. *Scientometrics*, **40** (3), 369-384.

Full Text: [1997\Scientometrics40, 369.pdf](1997/Scientometrics40,%20369.pdf)

Abstract: This paper gives an overview of the role of ambiguity in measurement and explores analytical methods for exploring its impact. It is argued that certain functional forms are more resilient than others to problems of ambiguity, and that these should be preferred when ambiguity is a serious concern.

Keywords: Functional, Impact, Informetric Distributions, Measurement, Methods, Paper, Role

Bhattacharya, S. (1997), Cross-national comparison of frontier areas of research in physics using bibliometric indicators. *Scientometrics*, **40** (3), 385-405.

Full Text: [1997\Scientometrics40, 385.pdf](1997/Scientometrics40,%20385.pdf)

Abstract: This paper attempts to reveal the characteristics of high activity areas of world research in Physics. ‘Frontier areas’ - areas of high activity and areas of low activity are identified. Research activities in ‘Frontier areas’ for twenty six countries (major countries) contributing maximum research output in Physics are analyzed for two time periods (1990 & 1995). The main objective of this study is to reveal the areas of research priorities, trends, gaps and similarity of research efforts of major countries in these ‘frontier’ areas. Key countries in these areas in both the time periods are identified. Multivariate Scaling Algorithm is applied to the countries and fields in each time period, and also simultaneously to understand the relationship between countries and fields and the dynamics of change in research priorities. Results and implications of this study for policy research is highlighted.

Keywords: Activity, Bibliometric, Bibliometric Indicators, Characteristics, Comparison, Dynamics, Indicators, Low, Output, Paper, Policy, Research, Similarity, Trends

Bonitz, M., Bruckner, E. and Scharnhorst, A. (1997), Characteristics and impact of the Matthew effect for countries. *Scientometrics*, **40** (3), 407-422.

Full Text: [1997\Scientometrics40, 407.pdf](1997/Scientometrics40,%20407.pdf)

Abstract: In this paper newly established characteristics of the so-called Matthew Effect for Countries (MEC) are presented: field-dependency, time-stability, order of magnitude. We find that the MEC is observable in all main scientific fields that were investigated. Over fifteen years the MEC has been relatively stable. The MEC is a redistribution phenomenon at the macro-level of the sciences. Its magnitude is small, the MEC affects only about five percent of the world production of citations. The MEC, however, crucially impacts many nations when their ‘national loss of citations’ amounts to a high percentage of their expected citations. The relationship between the MEC and Merton’s Matthew Principle is discussed. It is our hypothesis that the MEC provides an additional approach for the assessment of the scientific performance of nations.

Keywords: 27 Science Areas, 50 Nations, Assessment, Characteristics, Citations, Impact, Impacts, Order, Paper, Performance, Production, Sciences, Scientometric Weight

Bordons, M. and Zulueta, M.A. (1997), Comparison of research team activity in two biomedical fields. *Scientometrics*, **40** (3), 423-436.

Full Text: [1997\Scientometrics40, 423.pdf](1997/Scientometrics40,%20423.pdf)

Abstarct: A study of the structure and scientific activity of the most productive Spanish research teams in two biomedical subfields, Pharmacology & Pharmacy and Cardiovascular System (SCI), during the period 1990-93 was carried out through bibliometric indicators. The teams were characterized according to their size, production, productivity, research level and expected impact factor of their output, collaboration pattern and interdisciplinarity. Main differences between both subfields were analyzed and explained by their different clinical/basic character. The study was undertaken to identify structural or dynamic features of teams associated with good scientific performance.

Keywords: Activity, Bibliometric, Bibliometric Indicators, Collaboration, Departments, Dynamic, Features, Impact, Impact Factor, Indicators, Output, Performance, Production, Productivity, Publication-Rate, Research, SCI, Size, Structure, Team

Czapski, G. (1997), The use of deciles of the citation impact to evaluate different fields of research in Israel. *Scientometrics*, **40** (3), 437-443.

Full Text: [1997\Scientometrics40, 437.pdf](1997/Scientometrics40,%20437.pdf)

Abstract: One often uses the average citation impact factor in order to perform international comparisons between the levels of scientific performance within given disciplines. In averaging over all (or all cited) papers one may give undue weight to papers with few citations while, in fact, the standing of a country within a given field would be better assessed by looking only at the ‘successful’ papers in that discipline. The present papers suggests that one should do so by averaging citations only over the ten (or twenty) percent of the most cited papers in a discipline and use these in order to establish a ranking between countries. The case of Israel is used as an illustration of this approach.

Keywords: Citation, Citations, Eighties, Impact, Impact Factor, Indicators, Israel, Journals, Levels, National Performances, Order, Performance, Publication Output, Ranking, Research, Science Fields, World Science

Danell, R., Engwall, L. and Persson, O. (1997), The first mover and the challenger: The relationship between two journals in organization research. *Scientometrics*, **40** (3), 445-453.

Full Text: [1997\Scientometrics40, 445.pdf](1997/Scientometrics40,%20445.pdf)

Abstract: Many new journals are started in response to increasing specialization and limited space in existing journals. In this study two journals in organization research are studied, *Administrative Science Quarterly* as the first mover in the field and *Organization Studies* as the challenger. It is shown that the new journal gradually differ from the old in terms of the national origin of its authors as well as the documents cited. It is concluded that the scientific journal market may not mirror the copy-cat behaviour found among news papers or companies in other markets.

Keywords: Journal, New Journal, Research

? Egghe, L. (1997), Fractal and informetric aspects of hypertext systems. *Scientometrics*, **40** (3), 455-464.

Full Text: [1997\Scientometrics40, 455.pdf](1997/Scientometrics40,%20455.pdf)

Abstract: The present paper studies fractal features (such as the fractal dimension) of hypertext systems (such as WWW) and establishes the link with informetric parameters. More concretely, a formula for the fractal dimension in function of the average number of hyperlinks per page is presented and examples are calculated. In general the complexity of these systems is high. This is also expressed by formulae for the total number of hypertext systems that are possible, given a fixed number of documents.

Keywords: Breeds-Success Principle, Features, Fractal Dimension, Function, General, Hyperlinks, Laws, Paper, Parameters

? Faucompre, P., Quoniam, L. and Dou, H. (1997), An effective link between science and technology. *Scientometrics*, **40** (3), 465-480.

Full Text: [1997\Scientometrics40, 465.pdf](1997/Scientometrics40,%20465.pdf)

Abstract: The link between science and technology represents a major strategic stake, so the relation between scientific bibliographic references and technical bibliographic references can be of very important documentary interest. To set up this link, International Patent Classification catchwords have been used as a switching language. A previous feasibility study had shown the possibilities of such a full automatic correspondence and its obvious inadequacies. We present here the most important modifications brought to this correspondence, in particular the consideration of multilingual indexes which allow to link several indexation fields with one of the most complete representation of patent classification. The major evolution of our project affects the correspondence mechanism which now generates a global reindexation of bibliographic reference with classification codes. We also discuss the concept of correspondence itself which must be interpreted as a simple presumption of the link. There are some consequences due to these developments: First, insofar as there is not an univocal relation, end users do not have to select switching keywords which generate concordances. They can directly use codes which symbolize the industrial property classification. Next, main documentary indicators do not seem to be adapted to measure the performance evaluation of this new field. It has the single role of suggesting trails that can be explored. Lastly, it seems that only end users should be able to supply a complete validation and we show that a documentary validation is not sufficient.

Keywords: Bibliographic References, Classification, Concept, Consequences, Effective, Evaluation, Evolution, Global, Indicators, Industrial, Language, Mechanism, Multilingual, Performance, Reference, Representation, Role, Science, Validation

? Glänzel, W. (1997), On the possibility and reliability of predictions based on stochastic citation processes. *Scientometrics*, **40** (3), 481-492.

Full Text: [1997\Scientometrics40, 481.pdf](1997/Scientometrics40,%20481.pdf)

Abstract: A statistical model for citation processes, a particular version of a non-homogeneous birth process, is analysed in the context of predictions of future citation rates. Important properties of the process were already studied by the author in earlier papers. Although the applicability of the model was demonstrated by several examples, practical aspects of predictions and questions of statistical reliability were not tackled so far. The present study is focused on the demonstration of the possibility of true predictions and on the analysis of the statistical reliability of predictions based on the mean value function E(X(t)-X(s)\X(s)=i) of citation processes. The citation rates for papers published in 1980 and 1991 were recorded in the period 1980 through 1995, and 1991 through 1995, respectively, in all science areas. It is shown that parameters of mean value Functions estimated for earlier time periods can be applied to more recent years, too. As a byproduct, the model may serve as a validation tool for the particular choice of citation windows in evaluation studies.

Keywords: Analysis, Chemistry, Citation, Evaluation, Evaluation Studies, Function, Model, Parameters, Physics, Predictions, Process, Properties, Recent, Reliability, Science, Scientific Literature, Stochastic, Validation

? Grivel, L., Polanco, X. and Kaplan, A. (1997), A computer system for big scientometrics at the age of the World Wide Web. *Scientometrics*, **40** (3), 493-506.

Full Text: [1997\Scientometrics40, 493.pdf](1997/Scientometrics40,%20493.pdf)

Abstract: A computer system combining hypertext and database management technologies is shown to be appropriate with the goals of information analysis. Such a system, HENOCH, designed to easily store any SGML document in a relational database, and to make these data accessible via the World Wide Web is exemplified in the particular case where the stored data is the result of clustering and mapping tools on bibliographic data. The software features of this system (genericity, reusability, extensibility) are explained and justified by the use of the SGML tree structure and the encapsulation of creation and manipulation functions of the relational database management system (RDBMS). The interest of WWW-RDBMS-based user interface is demonstrated by two complementary types of navigation for information analysis: an intuitive exploration mode based on the map metaphor and an assisted searching mode based on the ‘Who does What, and Where, with Whom’ metaphor.

Keywords: Age, Analysis, Clustering, Cocitation, Creation, Encapsulation, Exploration, Features, Information, Interface, Management, Management System, Manipulation, Mapping, Navigation, Scientometrics, Searching, Software, Structure, Technologies, Tools, Tree, World Wide Web

Gupta, B.M., Sharma, P. and Karisiddappa, C.R. (1997), Growth of research literature in scientific specialities. A modelling perspective. *Scientometrics*, **40** (3), 507-528.

Full Text: [1997\Scientometrics40, 507.pdf](1997/Scientometrics40,%20507.pdf)

Abstarct: The paper discusses the application of three well known diffusion models and their modified versions to the growth of publication data in four selected fields of S&T. It is observed that all the three models in their modified versions generally improve their performance in terms of parameter values, fit statistics, and graphical fit to the data. The most appropriate model is generally seen to be the modified exponential-logistic model.

Keywords: Diffusion, Diffusion Models, Evolution, Growth, Innovation Diffusion, Model, Modelling, Models, Modified, Paper, Pattern, Performance, Publication, Research, Statistics, Technological Substitution

? Christensen, F.H., Ingwersen, P. and Wormell, I. (1997), Online determination of the journal impact factor and its international properties. *Scientometrics*, **40** (3), 529-540.

Full Text: [1997\Scientometrics40, 529.pdf](1997/Scientometrics40,%20529.pdf)

Abstract: The article describes the method for the online determination of the journal impact factor (JIF). The method is very simple and can be used both for the ISI defined journal impact factor and for the calculation of other generalised journal impact factors. But the direct online method fails for non-ISI journals i.e. journals not indexed by ISI to the three citation databases. For such journals only the ‘External Cited Impact Factor’ associated with citations from ISI journals (ECIFisi) can be determined online by the common method. As an extra benefit the online method makes available the determination of the geographical distribution of citations and citable units in relation to any given JIF, i.e. the international impact for a particular journal in a given year. The method is illustrated by calculating the generalised JIF, self-citations and ECIF(isi) as well as the international impact for Journal of Documentation and Scientometrics.

Keywords: Benefit, Citation, Citations, Databases, Determination, Distribution, Impact, Impact Factor, Impact Factors, ISI, Journal, Journal Impact Factors, Properties

Katz, J.S. and Hicks, D. (1997), How much is a collaboration worth? A calibrated bibliometric model. *Scientometrics*, **40** (3), 541-554.

Full Text: [1997\Scientometrics40, 541.pdf](1997/Scientometrics40,%20541.pdf)

Abstract: Interest in collaboration is increasing in policy circles. There are numerous international and national programs to encourage collaboration, for example, between university and industry researchers. However, little is know about the way in which collaboration changes the impact of a research publication. This paper explores how the impact (average citations per paper) varies with different types of collaboration. A calibrated bibliometric model is derived that demonstrates that collaborating with an author from the home institution or another domestic institution increases the average impact by approximately 0.75 citations while collaborating with an author from a foreign institution increases the impact by about 1.6 citations.

Keywords: Bibliometric, Citations, Collaboration, Home, Impact, Model, Paper, Policy, Publication, Research

? Kortelainen, T.A.M. (1997), Applying concepts of diffusion research in an informetric study. *Scientometrics*, **40** (3), 555-568.

Full Text: [1997\Scientometrics40, 555.pdf](1997/Scientometrics40,%20555.pdf)

Abstract: The frame of reference of the study consists of theoretical concepts adopted from the diffusion of innovations theory. The study focuses on the diffusion of a formerly national scientific journal toward a more international audience, and on factors that have influenced the diffusion. The study is part of a larger project aiming to construct a model that describes the diffusion of a scientific journal towards an international audience based on the diffusion theory and a model of information acquisition.

Keywords: Diffusion, Information, Journal, Model, Reference, Research, Theory

Krauskopf, M. and Vera, M.I. (1997), Assessment of scientific profiles and capabilities of Ph.D. programs in Chile: A scientometric approach. *Scientometrics*, **40** (3), 569-577.

Full Text: [1997\Scientometrics40, 569.pdf](1997/Scientometrics40,%20569.pdf)

Abstract: It is well known that the quality of a doctorate program is related to the level of involvement of its faculty in research. Thus, we worked with the hypothesis that postulates that if the in-house scientific output of the core faculty involved in a Ph.D. program can be appraised in such a manner that the achievements render quantitative and qualitative indicators, it is possible to depict profiles amenable for comparisons. We describe the methodology, that uses performance scientometric indicators, and results obtained after studying five Ph.D. programs in the field of Cell and Molecular Biology/Biochemistry in three different Chilean universities and show that the approach serves to portray the in-house capacity of each program *vis a vis* national and international standards.

Keywords: Capacity, Chile, Core, Faculty, Indicators, International Standards, Methodology, Output, Performance, Profiles, Program, Qualitative, Quality, Research, Science, Scientific Output, Standards, Universities

? Kretschmer, H. (1997), Patterns of behaviour in coauthorship networks of invisible colleges. *Scientometrics*, **40** (3), 579-591.

Full Text: [1997\Scientometrics40, 579.pdf](1997/Scientometrics40,%20579.pdf)

Abstract: The characteristic structure underlying interpersonal relations in social networks in general is identifiable in a great number of such social processes, as the spread of diseases, the propagation of information, the change of views or the dissemination of technological innovations. The patterns of behaviour reflected in the coauthorship networks of the invisible colleges of physics, resemble the general structure of relations identified in social networks beyond the communities of scholars. The patterns of behaviour are portrayed both as two-dimensional and three-dimensional models.

Keywords: Communities, Diseases, General, Information, Models, Social, Social Networks, Structure, Three-Dimensional

? De Lange, C. and Glänzel, W. (1997), Modelling and measuring multilateral co-authorship in international scientific collaboration. Part I. Development of a new model using a series expansion approach. *Scientometrics*, **40** (3), 593-604.

Full Text: [1997\Scientometrics40, 593.pdf](1997/Scientometrics40,%20593.pdf)

Abstract: International co-operation has strongly intensified during the last decades owing to rapid developments in scientific communication. Economic, political, and intra-scientific factors also strongly influence international collaboration links among individual countries. Obviously research results of international scientific co-operation are reflected in the documented scientific communication as international co-authorship links in scientific publications. Most bibliometric studies on this issue pertain to the share of international co-authored papers in national publication output and their impact on national and international research, or to the analysis and mapping of the structure of collaboration links. The present study attempts to develop a model to measure and analyse the extent of multilateral international co-authorship links. A new indicator, the Multilateral Collaboration Index (rho) is introduced and analysed as a function of the share of internationally co-authored papers (f). Based on f a series expansion approach is applied that can be considered an extension of a fractionation model by Nederhof and Meed and allows classifying the extent of multilateral links both among science fields and among individual countries. The paper is concluded by a first attempt to estimate the errors involved in our approach.

Keywords: Analysis, Bibliometric, Bibliometric Studies, Co-Authorship, Collaboration, Communication, Countries, East, Errors, Fractionation, Function, Germany, Impact, Indicator, International Collaboration, Mapping, Model, New Model, Output, Paper, Publication, Publications, Research, Research Results, Science, Sciences, Scientific Collaboration, Scientific Communication, Scientific Publications, Structure

? Glänzel, W. and De Lange, C. (1997), Modelling and measuring multilateral co-authorship in international scientific collaboration. Part II. A comparative study on the extent and change of international scientific collaboration links. *Scientometrics*, **40** (3), 605-626.

Full Text: [1997\Scientometrics40, 605.pdf](1997/Scientometrics40,%20605.pdf)

Abstract: The present study is focused on international collaboration in science, involving more than two countries. The authors developed a promising model to measure and analyse the extent of multilateral co-authorship links in a previous study. The model is based on a series expansion approach which relates a new indicator, the Multilateral Collaboration Index (rho), to the share of internationally co-authored papers (f). The model was found suitable to classify both the share of international papers, as well as the extent of multilateral links through the deviations from their expectations. A comparative analysis is made of changing collaboration patterns between 1983 and 1993 for 8 selected subfields, as well as all fields combined of the most active 38 countries. As expected an intensification of international scientific collaboration was observed, especially for a number of former COMECON countries. Different types of behaviour for different countries and science subfields emerged.

Keywords: Analysis, Co-Authorship, Collaboration, Comparative Analysis, Comparative Study, Countries, East, Germany, Indicator, Intensification, International Collaboration, Made, Model, Science, Sciences, Scientific Collaboration

Lewison, G. (1998), New bibliometric techniques for the evaluation of medical schools. *Scientometrics*, **41** (1-2), 5-16.

Full Text: [1998\Scientometrics41, 5.pdf](1998/Scientometrics41,%205.pdf)

Abstract: Bibliometrics have been used in novel ways to assist with the evaluation of two medical schools, one in England and one in Sweden. The first evaluation was intended to allow the relative strengths in 26 subfields of five component campuses to be estimated. Selective filters for each subfield were defined, many of them with the help of the school’s research staff, so that relevant papers could be retrieved from a database on the basis of their title keywords and specialist journals. The campus outputs were then analysed by the research level of the journals (clinical/basic) and their influence. In the second evaluation, nine different indicators of research output were produced so that the school could be compared with four others in Scandinavia. The indicators included measures of output, co-authorship, journal esteem and citations by papers and by patents.

Keywords: Bibliometric, Bibliometric Techniques, Citations, Co-Authorship, England, Evaluation, Indicators, Journal, Medical, Output, Patents, Performance, Research, School, Schools, Strengths, Sweden, Techniques

Lewison, G. and Dawson, G. (1998), The effect of funding on the outputs of biomedical research. *Scientometrics*, **41** (1-2), 17-27.

Full Text: [1998\Scientometrics41, 17.pdf](1998/Scientometrics41,%2017.pdf)

Abstract: The Research Outputs Database (ROD) has been used to investigate the effects of different input variables, including the numbers of funding bodies, on the impact of research papers in a biomedical subfield (gastroenterology). This was determined by the medium-term impact of the journals in which they were published. It was shown that, when account was taken of the effects of the other input factors, the mean impact for a group of papers increased with the number of authors, the type of research (basic more than clinical), and with the number and identity of the funding bodies. However it *decreased* slightly if there were more addresses, whether the paper was multinational had no significant effect. Previous work showing that multi-institution or multi-country papers are more highly cited reached this conclusion because it did not take into account the confounding effect of multiple funding sources, and possibly other factors.

Keywords: Biomedical Research, Clinical, Effects, Funding, Group, Identity, Impact, Paper, Research, Sources

? Luwel, M. and Moed, H.F. (1998), Publication delays in the science field and their relationship to the ageing of scientific literature. *Scientometrics*, **41** (1-2), 29-40.

Full Text: [1998\Scientometrics41, 29.pdf](1998/Scientometrics41,%2029.pdf)

Abstract: This article presents an exploratory analysis of publication delays in the science field. Publication delay is defined as the time period between submission and publication of an article for a scientific journal. We obtained a first indication that these delays are longer with regard to journals in the fields of mathematics and technical sciences than they are in other fields of science. We suggest the use of data on publication delays in the analysis of the effects of electronic publishing on reference/citation patterns. A preliminary analysis on a small sample suggests that - under rather strict assumptions - the cited half-life of references may be reduced with a factor of about 2 if publication delays decrease radically.

Keywords: Ageing, Analysis, Cited Half-Life, Effects, Half-Life, Journal, Publication, Publishing, Science, Sciences

Macias-Chapula, C.A., Rodea-Castro, I.P. and Narvaez-Berthelemot, N. (1998), Bibliometric analysis of AIDS literature in Latin America and the Caribbean. *Scientometrics*, **41** (1-2), 41-49.

Full Text: [1998\Scientometrics41, 41.pdf](1998/Scientometrics41,%2041.pdf)

Abstract: This work reports on the preliminary results of a bibliometric analysis of AIDS literature, as produced in or about Latin America and the Caribbean for the period 1980-1996. Two international and two regional secondary sources were used in order to obtain comparative analyses regarding for example, comprehensiveness of AIDS literature coverage and local/main frame visibility. Less than 1000 records were retrieved from each of the databases searched. Leading countries in AIDSLINE were Haiti, Brasil, Mexico and Puerto Rico. The distribution by year of publication showed a decrease in Haiti records, from 54 in 1983, to 4 in 1995. The rest of the countries either increased or maintained an average production throughout the years. Regional secondary information sources were less current and comprehensive in the field. Further lines of research are described by the authors.

Keywords: AID, AIDS, Analysis, Bibliometric, Bibliometric Analysis, Caribbean, Collaboration, Countries, Current, Databases, Distribution, Field, Immunodeficiency-Syndrome AIDS, Information, Latin America, Mexico, Order, Patterns, Production, Publication, Puerto Rico, Regional, Research, Sources, Visibility

? Narin, F. and Olivastro, D. (1998), Linkage between patents and papers: An interim EPO/US comparison. *Scientometrics*, **41** (1-2), 51-59.

Full Text: [1998\Scientometrics41, 51.pdf](1998/Scientometrics41,%2051.pdf)

Abstract: A unification of more than one million non-patent references (NPR’s) on the front pages of U.S. and EPO patents has been carried out, with a subsequent match to the Science Citation Index (SCI), in order to investigate the citation linkage between patented technology and the scientific research literature. The U.S. system shows an extremely rapid increase in linkage, with citations from U.S. patents to U.S. authored papers increasing more than three-fold over the last decade. The EPO system does not show any increase, the occurrence of non-patent references appears to be relatively constant in the EPO system over the last decade. In both systems the cited papers are in relatively basic journals, especially in biomedicine. In the U.S. system approximately 75 percent of the cited papers originate in public science institutions, showing large dependence of patented industrial technology on public science. We expect to find similar result in the EPO system.

Keywords: Biomedicine, Citation, Citations, Comparison, Dependence, Front, Industrial, Institutions, Occurrence, Order, Patents, Research, SCI, Science, Science Citation Index, Technology

? Noyons, E.C.M. and Van Raan, A.F.J. (1998), Advanced mapping of science and technology. *Scientometrics*, **41** (1-2), 61-67.

Full Text: [1998\Scientometrics41, 61.pdf](1998/Scientometrics41,%2061.pdf)

Abstract: In the paper we will present the adjustments we implemented on the mapping procedure. We consider them as important improvements to make the maps more user-friendly. The improvements concern the implementation of graphical user interfaces, and the addition of ‘map-external’ information. This interface enables the users of the maps to focus onto their specific areas of interest and to determine the position of actors in the field. In addition the ‘map-external’ information contributes to an objective validation of the maps. The presentation will include a demonstration of the electronic maps and added tools.

Keywords: Implementation, Information, Interface, Interfaces, Mapping, Mapping of Science, Paper, Position, Science, Tools, Validation

? Polanco, X., Francois, C. and Keim, J.P. (1998), Artificial neural network technology for the classification and cartography of scientific and technical information. *Scientometrics*, **41** (1-2), 69-82.

Full Text: [1998\Scientometrics41, 69.pdf](1998/Scientometrics41,%2069.pdf)

Abstract: This paper describes the implementation of multivariate data analysis: NEURODOC applies the axial k-means method for automatic, non-hierarchical cluster analysis and a Principal Component Analysis (PCA) for representing the clusters on a map. We next introduce Artificial Neural Networks (ANNs) to extend NEURODOC into a neural platform for the cluster analysis and cartography of bibliographic data. The ANNs tested are: the Adaptive Resonance Theory (ART 1), a Multilayer Perceptron (MLP), and an associative network with unsupervised learning (KOHONEN). This platform is intended for quantitative analysis of information.

Keywords: Analysis, Art, Cartography, Classification, Cluster, Cluster Analysis, Clusters, Implementation, Information, Learning, Multivariate, Neural Network, Paper, PCA, Principal Component Analysis, Quantitative Analysis

? Quoniam, L., Balme, F., Rostaing, H., Giraud, E. and Dou, J.M. (1998), Bibliometric law used for information retrieval. *Scientometrics*, **41** (1-2), 83-91.

Full Text: [1998\Scientometrics41, 83.pdf](1998/Scientometrics41,%2083.pdf)

Abstract: Zipf’s law was used to qualify all the key-words of documents in a data set. This qualification was used to build a graphical representation of the resulting indicator in each document The graphical resolution leads to a document dispatch in a three dimensional space. This graphical representation was used as an information retrieval tool without using any keyword. The presentation of a case study is internet available. The graph is drawn in Virtual Reality Markup Language (VRML) allowing a dynamic picture which is linked to a Database Management System (FreeWais). The experimentation was drawn to get a first impression of documents data set by querying without any keyword.

Keywords: Case Study, Dynamic, Experimentation, Indicator, Information, Information Retrieval, Internet, Law, Qualify, Representation, Resolution, Three-Dimensional

? Rao, I.K.R. (1998), An analysis of Bradford multipliers and a model to explain law of scattering. *Scientometrics*, **41** (1-2), 93-100.

Full Text: [1998\Scientometrics41, 93.pdf](1998/Scientometrics41,%2093.pdf)

Abstract: In his book on ‘Documentation’, Bradford derived the law of scattering, based on algebric explanation with the supposition that n(1) = n(2) = n. n(1) and n(2) are computed based on average no. of articles per journals in the first three zones. An analysis of a small sample of 12 data sets, using t-test suggests that it is unlikely that n(1) = n(2). Further an attempt has been made to identify a suitable model to explain the law of scattering, among the various models tried, log-normal fits much better than many models including the log-linear model.

Keywords: Analysis, Information, Law, Made, Model, Models, Periodical Literature

? Rey, J., Martin, M.J., Plaza, L., Ibanez, J.J. and Mendez, I. (1998), Changes on publishing behavior in response to research policy guidelines. The case of the Spanish Research Council in the field of agronomy. *Scientometrics*, **41** (1-2), 101-111.

Full Text: [1998\Scientometrics41, 101.pdf](1998/Scientometrics41,%20101.pdf)

Abstract: The aim of this study is to identify changes in publishing behavior of Spanish scientists belonging to the Area of Agronomy of the Spanish Research Council (CSIC), in response to scientific policy actions carried out in Spain. For this purpose, we analyze Spanish scientific output published in Spanish journals (covered by the ICYT database) as well as in international journals (covered by the Science Citation Index), during the period 1980-1995. Congress and conference publications, books and monographs, are also considered. The following changes in publication habits have been noticed: migration of works towards SCI journals and increased use of books and monographs as channel of publication of research works. A decreasing participation of Spanish researchers in scientific meetings has also been noticed, especially since 1989.

Keywords: Behavior, Guidelines, Journals, Migration, Output, Participation, Policy, Publication, Publications, Publishing, Research, SCI, Science Citation Index, Scientific Output, Scientific Policy, Spain

Russell, J.M. (1998), Publishing patterns of Mexican scientists: Differences between national and international papers. *Scientometrics*, **41** (1-2), 113-124.

Full Text: [1998\Scientometrics41, 113.pdf](1998/Scientometrics41,%20113.pdf)

Abstract: The publication and coauthorship patterns between 1980-1994 of 15 highly productive Mexican scientists were studied in relation to their 565 research papers involving only national institutions and 232 published with colleagues from abroad. Three scientists were selected from each of the following areas: Biomedicine, Chemistry, Physics, Astronomy and Astrophysics, and Geosciences. Parameters studied were: vehicles used for publication, document types, number of authors, collaborating countries, and author position. The results are discussed in relation to Mexico’s peripheral position with regard to the scientific center, and the increasing internationalization of Mexican science.

Keywords: Collaboration, Institutions, Position, Publication, Research, Science

? Small, H. (1998), A general framework for creating large-scale maps of science in two or three dimensions: The SciViz system. *Scientometrics*, **41** (1-2), 125-133.

Full Text: [1998\Scientometrics41, 125.pdf](1998/Scientometrics41,%20125.pdf)

Abstract: Data visualization techniques have opened up new possibilities for science mapping. To exploit this opportunity new methods are needed to position tens of thousands of documents in a single coordinate space. A general framework is described for achieving this goal involving hierarchical clustering, ordination of clusters, and the merging of ordinations into a common coordinate space. The SciViz system is presented as one particular implementation of this framework.

Keywords: Clustering, Clusters, General, Goal, Implementation, Mapping, Methods, Ordination, Position, Science, Techniques, Visualization

? Sen, S.K. and Chatterjee, S.K. (1998), Bibliographic scattering and time: An empirical study through temporal partitioning of bibliographies. *Scientometrics*, **41** (1-2), 135-154.

Full Text: [1998\Scientometrics41, 135.pdf](1998/Scientometrics41,%20135.pdf)

Abstract: Time dependence of bibliographic scattering is not at all understood. There are not many studies to establish any relation between growth of a bibliography over time and scattering. In this empirical study three different types of bibliographies have been taken. Each bibliography has been partitioned in different temporal periods (according as the particular bibliography should allow). The complete bibliography and the partitions have then been used to draw corresponding Bradford bibliographs whose natures have been studied. No conclusive relation between growth and scattering could be drawn except that the nature of the bibliograph depends on the value of concentration that is the ratio of the number of items and the number of sources in the bibliography. The paper shows that much needs to be done in this area and partition studies may be a useful technique.

Keywords: Concentration, Dependence, Growth, Paper, Partition, Partitioning, Sources, Temporal

Stefaniak, B. (1998), International cooperation of Polish researchers with partners from abroad: A scientometric study. *Scientometrics*, **41** (1-2), 155-167.

Full Text: [1998\Scientometrics41, 155.pdf](1998/Scientometrics41,%20155.pdf)

Abstract: Publications resulting from international cooperation and included in seven SCI annual files 1987-1989 and 1992-1995 were analyzed. It was observed that after the political changes of the turn of 1980s considerable increase in the number of publications was accompanied by the geographic development of co-authorship. Information coming from SCI 1992-1995, elaborated, completed and encoded were entered into an own database designed for analytical purposes. During these four years above 9600 papers were published in over 1600 prestige journals, of which almost 2200 publications resulted from multilateral cooperation. Altogether the foreign co-authors came from 102 countries, but over 80% of international papers were published in cooperation with the partners from 11 countries. The domestic participants came from over 200 research and educational organizations. It was found that the biggest share of papers within this multidisciplinary file represented physics (40%), chemistry (21%), and biomedical research (11%).

Keywords: Biomedical Research, Collaboration, Development, Multidisciplinary, Organizations, Publications, Research, SCI

Van Hooydonk, G. and Milis-Proost, G. (1998), Measuring impact by a full option method and the notion of bibliometric spectra. *Scientometrics*, **41** (1-2), 169-183.

Full Text: [1998\Scientometrics41, 169.pdf](1998/Scientometrics41,%20169.pdf)

Abstract: A full option method for determining impact takes into account citations to all cited publications, instead of limiting the analysis to ISI-publications only, as usually done in the standard method. The method was tested for the 258 early Ghent professors, teaching in 6 different faculties. The impact of monographs is, in general, much larger than the impact of articles (whether of ISI-type or not). This result remains valid for all six faculties separately Limiting the bibliometric visibility to ISI-publications reduces the number of citations to only 16%. Bibliometric spectra are presented, in which citations, cited publications and their impact are shown in function of the year of publication. The number of cited publications is always important to expose the influence of activity (production) upon bibliometric scores. For the faculty of Arts, the citations to early professors are compared with those obtained for the present-day generation: the bibliometric spectrum for the former group is rather discontinuous (showing a large erosion in the number of citations by year), whereas that of the latter is continuous. The Ghent citation data are also compared with those given internationally in the same period.

Keywords: Activity, Analysis, Bibliometric, Citation, Citations, Erosion, Faculty, Function, General, Group, Impact, Production, Publication, Publications, Standard, Teaching, Visibility

Vinkler, P. (1998), General performance indexes calculated for research institutes of the Hungarian academy of sciences based on scientometric indicators. *Scientometrics*, **41** (1-2), 185-200.

Full Text: [1998\Scientometrics41, 185.pdf](1998/Scientometrics41,%20185.pdf)

Abstract: Activities of research institutes of the Hungarian Academy of Sciences were assessed multi-dimensionally. Taking into account *goals and tasks* of the institutes, *weighted scientometric indicators* were suggested. The weights of the individual indexes were *distributed* among the institutes by the values of their indicators. The sum of the individual weighted scores representing special aspects of the total activity yields a *General Performance Index* (GPI) which, together with a thorough peer review, may be used for distributing grants.

Keywords: Activity, Basic Research, Indicators, Peer Review, Performance, Research, Review, Weights

Wagner-Döbler, R. (1998), Scientometric evidence for the existence of long economic growth cycles in Europe 1500-1900. *Scientometrics*, **41** (1-2), 201-208.

Full Text: [1998\Scientometrics41, 201.pdf](1998/Scientometrics41,%20201.pdf)

Abstract: In times of economic stagnation, the debate about ‘long waves’ of economic growth typically refreshes. This has also been the case in the period of the world-wide economic stagnation since 1970. But the results concerning the existence of long-term cycles of economic activity are still controversial. In this contribution, the ‘ups and downs in the pulse of science and technology’ (*Price*) are related to economic growth cycles. It turns out that Schumpeter’s contention of an inverse relationship between the level of scientific and technological activity on the one side and economic growth on the other side is correct for 1500 to 1900. Thereby also an indirect proof is furnished for the existence of long economic growth cycles in the last centuries.

Keywords: Activity, Economic, Europe, Growth, Long-Term, Pulse, Science, Technological Activity

? Wilson, C.S. (1998), Defining subject collections for informetric analyses: The effect of varying the subject aboutness level. *Scientometrics*, **41** (1-2), 209-223.

Full Text: [1998\Scientometrics41, 209.pdf](1998/Scientometrics41,%20209.pdf)

Abstract: Subject literature collections are typically formed by judgements which are inexplicit and imprecise. This seems to compromise the worth of precise measurements made of their properties. In this paper an examination is made of how several commonly-measured properties of subject literatures vary as an important factor in the compilation of subject collections is varied. The factor is the amount which a document must ‘say’ about a subject for it to be included in such a collection. This document property has been expressed in formal terms and given a simple measure for the one subject examined, the research topic of Bradford’s Law of Scattering. It is found that lowering the level of subject aboutness required for admission to a collection produces a large increase in the size of the collection obtained, and an appreciable change in some size-related properties. For these properties, the initial concern is warranted. However, other parameters are found to be invariant to such changes.

Keywords: Bradford Distribution, Examination, Made, Measurements, Paper, Parameters, Properties, Research, Size

? Wouters, P. (1998), The signs of science. *Scientometrics*, **41** (1-2), 225-241.

Full Text: [1998\Scientometrics41, 225.pdf](1998/Scientometrics41,%20225.pdf)

Abstract: Since the Science Citation Index emerged within the system of scientific communication in 1964, an intense controversy about its character has been raging: in what sense can citation analysis be trusted? This debate can be characterized as the confrontation of different perspectives on science. In this paper the citation representation of science is discussed: the way the citation creates a new reality of as well as in the world of science, the main features of this reality, and some implications for science and science policy.

Keywords: Analysis, Citation, Citation Analysis, Citations, Communication, Features, Paper, Policy, Representation, Science, Science Citation Index, Science Policy, Science-Policy, Scientific Communication

? Yitzhaki, M. (1998), The ‘language preference’ in sociology: Measures of ‘language self-citation’, ‘relative own-language preference indicator’, and ‘mutual use of languages’. *Scientometrics*, **41** (1-2), 243-254.

Full Text: [1998\Scientometrics41, 243.pdf](1998/Scientometrics41,%20243.pdf)

Abstract: Although between one-third to one-half of world social sciences research literature is published in languages other than English, studies show very scant use of it by American and English scholars. Almost all studies, however, were conducted from the Anglo-Saxon perspective, limiting the scope of the study to English-published sources or English-speaking scientists and research workers. The present study aimed at assessing the scope of the language preference in a social sciences field, not only among American and British scholars, but among German and French ones as well, using the technique of citation analysis. Samples including mostly 50-60 original research articles were drawn from the 1985-1994 volumes of nine leading sociology journals published in the US, UK, Germany and France and the references appended to each were scrutinized in order to determine the frequency distribution of the languages cited in each periodical. Findings clearly showed a strong preference of writers to cite material in their own language. However, the extent of this bias differed from journal to journal. The American and British writers rank first, with close to 99% of their references being in English. German scholars rank next, preferring German sources in 75% of the cases, and French scholars quote French sources in only 66% of their references. In order to calculate the new refined measure of ‘relative own-language preference’ (ROLP) indicator, the proportions of ‘language self-citation’ were related to the estimated proportions of these languages in the existing body of sociology research. This measure reveals that German sociologists have the strongest bias towards their mother-tongue, their ratio of references in German exceeding almost 12 to 28 times the expected figure according to the German language share in sociology research. Next come French sociologists (8 to 14 times) while American and British ones display the lowest own-language bias, only slightly higher than expected. Further analysis of the foreign languages preference of each group, according to a ‘mutual-use’ matrix, shows a relative low use of German and French sources by British-American sociologists.

Keywords: Analysis, Bias, Citation, Citation Analysis, Distribution, France, Germany, Group, Indicator, Journal, Language, Languages, Low, Order, Preference, Rank, Research, Research Articles, Sciences, Social, Social Sciences, Sources, UK, US

Zitt, M. and Bassecoulard, E. (1998), Internationalization of scientific journals: A measurement based on publication and citation scope. *Scientometrics*, **41** (1-2), 255-271.

Full Text: [1998\Scientometrics41, 255.pdf](1998/Scientometrics41,%20255.pdf)

Abstract: Although impact factor and related measurements are the best-known features of scientific journals, other characteristics are of particular interest. The way a journal reflects the internationalized nature of science may be determined by many methods, one of which is based on the distribution of authoring and citing countries. This can be systematically measured either by a comparison of these distributions with averages profiles of a discipline or specialty, or by concentration indexes on the other. This paper focuses on the first approach. As the average profile of science drifts with the level of visibility, stratification by impact level is discussed. In this study, experimental internationalization indexes were calculated on the SCI for journals belonging to Earth&Space and Applied Biology. Convergence of measurements (types of indexes, type of normalization, publication vs citation scope) is adressed. Internationalization indexes may have a variety of applications, including characterization of the scientific publishing market and sampling of the SCI for science indicators.

Keywords: Applications, Averages, Characteristics, Characterization, Citation, Comparison, Concentration, Distribution, Distributions, Drifts, Experimental, Features, Impact, Impact Factor, Indicators, Journal, Measurement, Measurements, Methods, Paper, Profile, Profiles, Publication, Publishing, Sampling, SCI, Science, Set, Stratification, Visibility

Okubo, Y., Dore, J.C., Ojasoo, T. and Miquel, J.F. (1998), A multivariate analysis of publication trends in the 1980s with special reference to South-East Asia. *Scientometrics*, **41** (3), 273-289.

Full Text: [1998\Scientometrics41, 273.pdf](1998/Scientometrics41,%20273.pdf)

Abstract: This study is a follow-up to a published Correspondence Factor Analysis (CFA) of a dataset of over 6 million bibliometric entries. In the previous paper, CFA was used to show how the 48 most prolific countries stand in relation to each with regard to their publication interests in 17 specific disciplinary areas and one multidisciplinary field over the period 1981-1992. In this paper, we illustrate how the publication profiles of these 48 countries evolved over time during this period. We have (i) shown how analysis of the dataset highlights cutting edge versus ancient disciplines, (II) identified the countries whose publication patterns underwent the most marked changes (e.g. the Asian dragons who chose to focus on engineering, materials sciences, computer sciences and molecular biology), and (iii) revealed the widespread attraction exerted by the publication pattern of the USA. There is, without doubt, an overall shift toward an American-style pattern that may be a true reflection of research interests worldwide but that may also be explained by the hegemony of those who hold the reins of international publication.

Keywords: 48 Countries, Analysis, Asia, Asian, Bibliometric, Biology, Collaboration, Cutting, Engineering, Follow up, Follow-up, Materials, Molecular Biology, Multidisciplinary, Multivariate, Multivariate Analysis, Paper, Patterns, Period 1981-1992, Profiles, Publication, Reference, Research, Science, Sciences, Southeast, Southeast Asia, Trends, Typology, USA

? O’Neill, G.P. (1998), Authorship patterns in theory based versus research based journals. *Scientometrics*, **41** (3), 291-298.

Full Text: [1998\Scientometrics41, 291.pdf](1998/Scientometrics41,%20291.pdf)

Abstract: This article examines authorship pattern in two theory based journals, one American and one Canadian. Data were collected on the number of single, double, and multiple authors from 1955 to 1994 in Educational Theory and from 1970 to 1994 in the Journal of Educational Thought. The years were, in turn, divided into eight and five five-year intervals respectively. Frequencies and percentages were generated for each interval and chi squares were computed between intervals and overall. In addition, author/article ratios were calculated for each year for Educational Theory. Results revealed that the majority of authorships were single in both journals regardless of the date of publication. These findings further challenge de Solla Price’s predictions that co-and multiple authorships would eventually outnumber single authorships. The failure to distinguish between journal type and to allow for discrepancies within disciplines raises new concerns about conclusions drawn, to date, in the literature.

Keywords: Authorship, Clinical Research, Journal, Multiple Authorship, Predictions, Publication, Research, Theory, Trend

Fonseca, L., Velloso, S., Wofchuk, S. and de Meis, L. (1998), The relationship between advisors and students. *Scientometrics*, **41** (3), 299-312.

Full Text: [1998\Scientometrics41, 299.pdf](1998/Scientometrics41,%20299.pdf)

Abstract: Considering the influence of graduation courses on the scientific productivity in Brazil, fifty productive Brazilian scientists working in life sciences were interviewed about their relationship with their advisors and their own experience with their students. Admired by freedom and intellectual qualities, by their love and dedication for science, advisors seem to have had a deep influence on their students. This bond is not free from either an idealized frame or from some complaints and conflicts. Interviewed scientists see in themselves lesser qualities and faults but the same respect for freedom. Some students are thought to be specially important to the interviewed’s productivity. Eldest and most productive scientists seem to be intellectually more impressed by their advisors than the other groups. The emotional and sometimes strong and idealized bond between advisor and students lead us to believe that the stated frequencies of conflicts might be underestimated.

Keywords: Brazil, Emotional, Graduation, Groups, Lead, Life, Productivity, Science, Sciences, Scientific Productivity, Students

Leta, J., Lannes, D. and de Meis, L. (1998), Human resources and scientific productivity in Brazil. *Scientometrics*, **41** (3), 313-324.

Full Text: [1998\Scientometrics41, 313.pdf](1998/Scientometrics41,%20313.pdf)

Abstract: The number of Brazilian scientific publications increased from 0.29% to 0.56% of the worldwide total during the 1981-1993 period. There was a decrease of the funds allocated to most scientific activities, except for that allocated for training of new scientists. The numbers of research fellowships and scientific publications increased at the same ratio during the period. The pattern of scientific publications and the number of fellowship granted along the years in the different fields of research were analyzed. The data presented indicate that even in a period of economic crisis, a selective investment of funds in human resources may lead to an increase of the scientific productivity of a country in all science fields.

Keywords: Brazil, Crisis, Economic, Fellowship, Human, Latin-America, Lead, Productivity, Publications, Research, Science, Scientific Productivity, Scientific Publications, Selective, Training

? So, C.Y.K. (1998), Citation ranking versus expert judgment in evaluating communication scholars: Effects of research specialty size and individual prominence. *Scientometrics*, **41** (3), 325-333.

Full Text: [1998\Scientometrics41, 325.pdf](1998/Scientometrics41,%20325.pdf)

Abstract: Numerous attempts have been made to validate the use of citation as an evaluation method by comparing it with peer review. Unlike past studies using journals, research articles or universities as the subject matter, the present study extends the comparison to the ranking of individual scholars. Results show that citation ranking and expert judgment of communication scholars are highly correlated. The citation method and the expert judgment method are found to work batter in smaller research areas and yield more valid evaluation results for more prominent scholars.

Keywords: Citation, Communication, Comparison, Evaluation, Made, Matter, Peer, Peer Review, Ranking, Research, Research Articles, Research Performance, Review, Size, Universities, Validate, Yield

Thomas, P.R. and Watkins, D.S. (1998), Institutional research rankings via bibliometric analysis and direct peer review: A comparative case study with policy implications. *Scientometrics*, **41** (3), 335-355.

Full Text: [1998\Scientometrics41, 335.pdf](1998/Scientometrics41,%20335.pdf)

Abstract: Recent years have seen enormously increased interest, in the comparative evaluation of research quality in the UK, with considerable resources devoted to ranking the output of academic institutions relative to one another at the sub-discipline level, and the disposition of even greater resources dependent on the outcome of this process. The preferred methodology has been that of traditional peer review, with expert groups of academics tasked to assess the relative worth of all research activity in ‘their’ field. Extension to institutional evaluation of a recently refined technique of journal ranking (Discipline Contribution Scoring) holds out the possibility of ‘automatic’ evaluation within a time-frame considerably less than would be required using methods based directly on citation counts within the corpus of academic work under review. This paper tests the feasibility of the technique in the sub-field of Business and management Studies Research, producing rankings which are highly correlated with those generated by the much more complex and expensive direct peer review approach. More generally, the analysis also gives a rare opportunity directly to compare the equivalence of peer review and bibliometric analysis over a whole sub-field of academic activity in a non-experimental setting.

Keywords: Academic, Activity, Analysis, Bibliometric, Bibliometric Analysis, Case Study, Citation, Complex, Departments, Determinants, Evaluation, Groups, Institutions, Journal, Journals, Management, Methodology, Methods, Outcome, Output, Paper, Peer Review, Policy, Policy Implications, Process, Psychology, Publication, Quality, Ranking, Rankings, Research, Research Performance, Research Quality, Review, Sciences, Scores, Tests, UK

? Jain, A., Garg, K.C., Sharma, P. and Kumar, S. (1998), Impact of SERC’s funding on research in chemical sciences. *Scientometrics*, **41** (3), 357-370.

Full Text: [1998\Scientometrics41, 357.pdf](1998/Scientometrics41,%20357.pdf)

Abstract: The paper assesses impact of Science and Engineering Research Council (SERC) funding in chemical sciences during 1976-1989 using scientometric techniques. Other indicators like awards won, fellowship to prestigious academies, membership to editorial boards received by the project investigators, Ph.D. degrees awarded, collaborations established and new courses introduced due to SERC funding have also been analyzed. The study indicates that activity index of research out put in various frontier areas of chemical sciences have gone up despite a decrease in Indian activity index in these areas. The growth pattern of papers for ‘Organometallic and Organometalloidal Compounds’ are similar for India and world. Contribution of SERC’s project investigators in high impact factor (greater than or equal to 2) journals and the citations received by the papers published by them are higher than Indian contributions in chemical sciences. The SERC funding has resulted in a three fold increase in the number of Ph.D, degrees awarded in chemical sciences and SERC project investigators have won many prestigious awards, fellowship to academies and membership of the editorial board of the journals. The SERC funded research has also resulted in new courses at various universities.

Keywords: Activity, Chemical, Citations, Fellowship, Funding, Growth, Impact, Impact Factor, Index, India, Indicators, Model, Paper, Research, Sciences, Techniques, Universities

Schwarz, A.W., Schwarz, S. and Tijssen, R.J.W. (1998), Research and research impact of a technical university: A bibliometric study. *Scientometrics*, **41** (3), 371-388.

Full Text: [1998\Scientometrics41, 371.pdf](1998/Scientometrics41,%20371.pdf)

Abstract: The research output of the Danish Technical University (DTU) has been studied as an aspect of the organization’s research policy and visibility in its international context. papers published in the three-year period (1992-94) were grouped according to 20 clusters of research areas. Using citation analysis techniques, the dynamics of citation frequencies, and a number of other features of the research system, like self-citation, research collaborations, relative impact on the international literature, etc., could be studied. The methods can be used to analyze institutional and national research efforts and to monitor effects of changing policies.

Keywords: Analysis, Bibliometric, Bibliometric Study, Citation, Citation Analysis, Dynamics, Indicators, International, Literature, Methods, Policy, Research, Research Performance, Research Policy, Self-Citation, Techniques, University

? Mccain, K.W. (1998), Neural networks research in context: A longitudinal journal cocitation analysis of an emerging interdisciplinary field. *Scientometrics*, **41** (3), 389-410.

Full Text: [1998\Scientometrics41, 389.pdf](1998/Scientometrics41,%20389.pdf)

Abstract: A cocitation analysis for thirty-six journals and other publications in neural networks research and related disciplines was conducted over three consecutive time periods spanning the years 1990 - early 1997. Cluster analysis and MDS maps identified groupings representing foundation research areas (physics/optics, computer engineering, neuroscience, expert systems gi cognition, and perception) along with neural networks and mathematical modeling of neural systems. Principal components analysis demonstrated a similar structure, with several journals and books loading on a majority of the factors. An INDSCAL analysis showed an increasing separation between natural sciences/psychology and engineering/neural networks research from the first time period to the third.

Keywords: Analysis, Cocitation, Cognition, Engineering, Expert Systems, Interdisciplinary, Journal, Loading, Longitudinal, Mathematical Modeling, Modeling, Natural, Neural Networks, Neuroscience, Perception, Publications, Research, Separation, Specialties, Structure

? Marton, J., Hulesch, H. and Zallar, I. (1998), Intensity breeds effectivity. *Scientometrics*, **41** (3), 411-415.

Full Text: [1998\Scientometrics41, 411.pdf](1998/Scientometrics41,%20411.pdf)

Abstract: The 1990-1996 publication activity of 10 medium-sized European countries in the leading journals of 37 life science disciplines and in the seven top general life science journals was investigated. For each country the number of leading disciplinary journal articles per 100000 inhabitants (intensity) was compared to the percentage of top journal articles (:effectivity). A high and significant correlation, i.e. quality heightening was found.

Keywords: Activity, Correlation, General, Intensity, Journal, Life, Output, Publication, Quality, Science

? Vinogradov, A.E. (1998), Scientists of old vintage support a ‘winter-biased birthday’ theory. *Scientometrics*, **41** (3), 417-420.

Full Text: [1998\Scientometrics41, 417.pdf](1998/Scientometrics41,%20417.pdf)

Abstract: The association of the season of birth with lifetime intellectual achievement was studied by means of analysis of two data sets, one of the prominent chemists of the world and another of members of the Russian Academy of Sciences (RAS). It is found that a (statistically) significantly greater number of prominent chemists born before 1850 and of the full members of RAS born before 1875 were born in month of the winter half-year than of the summer one. The effect was gradually decreasing with time, the decrease being slower in Russia. The possible influence of the season of birth on the early personality development is discussed.

Keywords: Achievement, Analysis, Dates, Development, Lifetime, Personality, RAS, Revolutionary Birthdays, Russia, Season, Support, Theory, Winter

Mély, B., el Kader, M.Abd., Dudognon, G. and Okubo, Y. (1998), Scientific publications of China in 1994: Evolution or revolution? *Scientometrics*, **42** (1), 3-16.

Full Text: [1998\Scientometrics42, 325.pdf](1998/Scientometrics42,%20325.pdf)

Abstract: SCI data bases have been widely used to analyse scientific production of various nations, their position in the international research community as well as their fields specializations. In the present study we examined, within the same methodological framework, the impact of the drastic reorientation of science funding systems which occurred in China (PRC) in the midst of the eighties. A decade after this turning point the pattern of Chinese publications from the 1994 SCI-CDRom reflects those of other countries although with its own peculiarities i.e. a relative weakness of life sciences and a prevalence of fundamental physics compared to the world average. Some effect of PRC’s policy could nevertheless be detected on this SCI profile like e.g. a neat increase of international papers after the opening of the country or the relatively high weight of collaborative works with laboratories from Hong Kong. We suggest that SCI data base is best suited for the analysis of public research of international standard due to the narrowness of the SCI window concerning applied research.

Keywords: Analysis, Base, China, Chinese, Collaboration, Community, Countries, Funding, Hong Kong, Impact, Life, Policy, Position, Prevalence, Production, Profile, Publications, Research, SCI, Science, Sciences, Scientific Production, Standard, Turning

? Raina, D. and Gupta, B.M. (1998), Four aspects of the institutionalization of physics research in India (1900-1950): Substantiating the claims of historical sociology through bibliometrics. *Scientometrics*, **42** (1), 17-40.

Full Text: [1998\Scientometrics42, 17.pdf](1998/Scientometrics42,%2017.pdf)

Abstract: This paper examines the process of the institutionalization of research in physics in India. In order to do so, it employs bibliometric data such as research publications in physics research journals between 1900 and 1950. This data is then analyzed to obtain certain indicators that are pointers of the aspects of the institutionalization of research in physics in India. The four aspects of institutionalization studied here are important for the researches of those adopting sociological approaches in the study of the history of sciences. Thus the bibliometric techniques employed complements the efforts of historians of science studying the professionalization of physics research in India, and in this case those dealing with disciplines like physics. Further, the bibliometric data helps substantiate the claims of historians of science that the years 1905 to 1935 were particularly important for the history of physics in India. The conclusions of historians are based on success stories of a few leading physicists of the time. Within an institutional framework, this paper argues that there was a larger ground swell indicative of the emergence of a physics research community in India.

Keywords: Bibliometric, Bibliometric Techniques, Bibliometrics, Collaboration, Community, Emergence, Historical, History, India, Indicators, Order, Paper, Process, Publications, Research, Research Journals, Science, Sciences, Techniques

Tijssen, R.J.W. and van Wijk, E. (1998), The global science base of information and communication technologies: Bibliometric Analysis of ICT Research papers. *Scientometrics*, **42** (1), 41-60.

Full Text: [1998\Scientometrics42, 41.pdf](1998/Scientometrics42,%2041.pdf)

Abstract: The science and engineering base is a key source of knowledge for the development and use of Information and Communication Technologies (ICTs). In order to be able to effectively describe and monitor world-wide scientific activity related to ICTs, it is important to be able to provide reliable macro-level statistics of this knowledge base. International bibliographic databases and related bibliometric indicators together provide an analytical framework and appropriate measures to cover both the ‘supply side’ - research capabilities and outputs - and ‘demand side’ - collaboration, diffusion and citation impact - related to the ICT research. This paper presents results of such a bibliometric study describing macro-level features of this ICT knowledge base. The data were retrieved from a specially developed *CWTS ICT Database* which provides a broad-scope world-wide coverage of ICT-relevant research papers published in high-quality international scientific and technical journals. The cross-country comparison focuses on the level of scientific output and co-operation patterns of the most actively publishing nations with a focus on the three Triad zones - the European Union, the USA and Japan.

Keywords: Activity, Analysis, Base, Bibliographic Databases, Bibliometric, Bibliometric Indicators, Bibliometric Study, Citation, Collaboration, Communication, Comparison, Databases, Development, Diffusion, Engineering, Engineers, European Union, Features, Global, Indicators, Information, Information And Communication, Japan, Key, Knowledge, Knowledge Base, Order, Output, Paper, Patterns, Publishing, Research, Science, Scientific Output, Source, Statistics, Technologies, USA

Fernández, J.A. (1998), The transition from an individual science to a collective one: The case of astronomy. *Scientometrics*, **42** (1), 61-74.

Full Text: [1998\Scientometrics42, 61.pdf](1998/Scientometrics42,%2061.pdf)

Abstract: The trend toward collectivization in Astronomy during this century (1901-1996), as measured by the increase in the number of authors per paper, is analyzed. For this purpose, two leading astronomical journals: *The Astrophysical Journal and Monthly Notices of the Royal Astronomical Society* are surveyed. It is found that the average number of authors per paper has jumped from a little more than one in the first half of this century to about three at present. Most of this dramatic increase has taken place during the last 20-25 years. At the same time, the ratio of *collective* papers (three or more authors) to single-authored ones has passed from nearly zero to 3-4 at present. The latter means that collective papers were almost nonexistent until the fifties or sixties to become nowadays 3-4 times more frequent than single-authored ones. The reasons underlying the collectivization of Astronomy (and perhaps of all natural sciences) are analyzed. The growing professionalization of science accompanied by a massive influx of graduate students into University research institutes, the revolution in communication, the pressure to publish in order to progress in a scientific career, and the growing complexity of knowledge are invoked as causes for the abandonment of the traditional individualism in science to a collective regime.

Keywords: Communication, Knowledge, Natural, Order, Paper, Pressure, Research, Science, Sciences, Students, Trend, Trends

Rousseau, S. and Rousseau, R. (1998), The scientific wealth of European nations: Taking effectiveness into account. *Scientometrics*, **42** (1), 75-87.

Full Text: [1998\Scientometrics42, 75.pdf](1998/Scientometrics42,%2075.pdf)

Abstract: In this study we continue the application of Data Envelopment Analysis (DEA) to assess the efficiency and effectiveness of the R&D effort of European countries. We use GDP, active population and R&D expenditure as inputs, and publications and patents as outputs. Being effective means that, in order to obtain a maximum efficiency score countries are forced to perform on every output goal. A discussion of each country’s performance and a comparison with May’s Science results concludes our analysis.

Keywords: Analysis, Comparison, Effective, Effectiveness, Efficiency, GDP, Goal, Inputs, Order, Output, Patents, Performance, Population, Publications

Wang, C.D. and Wang, Z. (1998), Evaluation of the models for Bradford’s law. *Scientometrics*, **42** (1), 89-95.

Full Text: [1998\Scientometrics42, 89.pdf](1998/Scientometrics42,%2089.pdf)

Abstract: A goodness of fit test is conducted for two models for Bradford’s law given by Egghe and Smolkov. The conclusion is that Smolkov’s model is of comparatively higher accuracy. Finally the paper points out the necessity of carrying out statistical tests for comparisons more frequently for the new models of Bradford’s law in the development of the law in order to get the best model.

Keywords: Accuracy, Development, Law, Model, Models, Order, Paper, Statistical Tests, Test, Tests

? Falkingham, L.T. and Reeves, R. (1998), Context analysis - A technique for analysing research in a field, applied to literature on the Management of R&D at the Section Level. *Scientometrics*, **42** (2), 97-120.

Full Text: [1998\Scientometrics42, 97.pdf](1998/Scientometrics42,%2097.pdf)

Abstract: Context analysis is a new method for appraising a body of publications. The process consists of creating a database of attributes assigned to each paper by the reviewer and then looking for interesting relationships in the data. Assigning the attributes requires an understanding of the subject matter of the papers. We present findings about one particular research field, Management of R&D at the Section Level. Our findings support the view that this body of academic publications does nor meet the needs of practitioner R&D managers. The paper discusses practical aspects of how to apply the method in other fields.

Keywords: Academic, Analysis, Matter, Paper, Process, Publications, Research, Strategic Management, Support, Technology

? Nemtsov, A.V. and Zorin, N.A. (1998), Mathematical methods in psychiatric papers. *Scientometrics*, **42** (2), 121-128.

Full Text: [1998\Scientometrics42, 121.pdf](1998/Scientometrics42,%20121.pdf)

Abstract: A comparative study was carried out to determine the trend in the use of statistical methods in the papers published in the leading Russian, American and British psychiatric journals of the 1980 -90 -ies. Within 10 years the quota of papers with statistics increased considerably in the American and British journals (from 58.6% to 67.6%), especially in the Archives of General Psychiatry (88%). Qualitative changes were notable as well, tending towards the use of non-ordinary innovative.,methods. As regards the Russian psychiatric papers the use of statistical methods was a rare occurrence (21.8% in 1980s), that never changed within 10 years.

Keywords: Comparative Study, Methods, Occurrence, Statistical Methods, Statistics, Trend

de Oliveira Cabral, J.E. (1998), Survey on technological innovative behavior in the Brazilian Food Industry. *Scientometrics*, **42** (2), 129-169.

Full Text: [1998\Scientometrics42, 129.pdf](1998/Scientometrics42,%20129.pdf)

Abstract: This paper is based on the information collected through a survey on technological innovation in a relatively large sample of 1000 firms of the Brazilian Food industry (hereafter BFI). 248 firms (24.8%) responded to the questionnaire and 77 (31.0%) declared that they had introduced innovations in the period surveyed (1994-1996). This paper concentrates both on the different characteristics related to food firms and innovative activity and on the nature of the innovations. Regarding the former we have asked questions about firms’ industrial sector, major activities, production stages, ownership, age, turnover, exports effort, advertising, R&D and technological innovation effort, size (number of employees), external alliances, organization of management functions (technological innovation policy, long term strategic plan, marketing research), and perceived barriers to innovation. Regarding the nature of the innovations, questions included: institutional sources of knowledge of the innovations, sources of innovations (external or internal), degree of protection of innovations (patents and other means), external collaboration, novelty of innovations (radical or incremental), type of innovations (product, process or combined), newness of innovations (to the world, to the country or to the firm), and impact of innovations on inputs (manpower, material, capital and energy). The results of the research are presented in this paper in a descriptive way. Therefore, we have not carried out advanced statistical analysis and we have not tried to establish cause-effect relationships among variables, but just links among them and trends. From the analysis, we can claim that technological innovation is actually a very complex process within firms, even though they are in a so called ‘low-tech’ industry. Nevertheless, it is possible to identify outstanding factors linked to this process both at industry level (some sectors are more innovative than others) and at Arm level (the large firms tend to be more innovative than small ones).

Keywords: Activity, Advertising, Age, Analysis, Barriers, Behavior, Capital, Characteristics, Collaboration, Complex, Energy, Firms, Food, Impact, Industrial, Information, Innovation, Inputs, Knowledge, Long-Term, Management, Paper, Patents, Plan, Policy, Process, Production, Protection, Questionnaire, Radical, Research, Size, Sources, Statistical Analysis, Survey, Technical Change, Technological Innovation, Trends, Turnover

? Kutlaca, D.G. (1998), Patent-related activities in Serbia from 1921 to 1995. *Scientometrics*, **42** (2), 171-193.

Full Text: [1998\Scientometrics42, 171.pdf](1998/Scientometrics42,%20171.pdf)

Abstract: In 1883 the Kingdom of Serbia was a co-founder of the well-known Paris Convention dedicated to protection of industrial property. This paper presents the analysis of inventive activities in Serbia in the period from 1921 to 1995. The available patent statistics is analyzed from the aspects of: (a) patenting structure according to the International Patent Classification sections, and (b) patenting dynamics. The findings of analysis indicate: (1) the fields in which technology development potentials are created in Serbia, and (2) the variations in inventors’ productivity as a direct consequence of the variation in the country’s innovation policy.

Keywords: Analysis, Development, Dynamics, Industrial, Innovation, Paper, Policy, Productivity, Protection, Statistics, Structure

Meyer, M. and Persson, O. (1998), Nanotechnology - Interdisciplinarity, patterns of collaboration and differences in application. *Scientometrics*, **42** (2), 195-205.

Full Text: [1998\Scientometrics42, 195.pdf](1998/Scientometrics42,%20195.pdf)

Abstract: Nanotechnology is a novel technological field said to be one of the key technologies in the 21st century revolutionizing information technology, materials and medicine. Bibliometric quantification is a way to show the emergence of a new technology. Braun et al. (1) could establish an exponential growth pattern of publications in nano-science and technology starting in the early 1990s. Using their study as basis we intend to further characterize nanotechnology using bibliometric as well as patent data. We can show that the share of boundary-spanning publications is exceptionally high in the field of nanotechnology. Our co-authorship analysis indicates that countries follow different patterns of collaboration. Some countries tend to have bilateral relations while others collaborate with a much larger array of nations. Patent data in combination with bibliometric reveals differences in the application of science. In our conclusion we raise a number of questions requiring an analysis using also other types of data. Still, a closer investigation and disaggregation of bibliometric data may come up with additional findings.

Keywords: Analysis, Bibliometric, Bilateral, Co-Authorship, Collaboration, Disaggregation, Emergence, Growth, Information, Information Technology, Investigation, Key, Materials, Nanotechnology, Publications, Quantification, Science, Technologies

? Bar-Ilan, J. (1998), On the overlap, the precision and estimated recall of search engines, a case study of the query ‘Erdos’. *Scientometrics*, **42** (2), 207-228.

Full Text: [1998\Scientometrics42, 207.pdf](1998/Scientometrics42,%20207.pdf)

Abstract: In this paper we investigate the retrieval capabilities of six Internet search engines on a simple query. As a case study the query ‘Erdos’ was chosen. Paul Erdos was a world famous Hungarian mathematician, who passed away in September 1996. Existing work on search engine evaluation considers only the first ten or twenty results returned by the search engine, therefore approximation of the recalls of the engines has not been considered so far. In this work we retrieved all 6681 documents that the search engines pointed at and thoroughly examined them. Thus we could calculate the precision of the whole retrieval process, study the overlap between the results of the engines and give an estimate on the recall of the searches. The precision of the engines is high, recall is very low and the overlap is minimal.

Keywords: Case Study, Evaluation, Internet, Low, Paper, Precision, Process

Anegon, F.D., Contreras, E.J. and Corrochano, M.D. (1998), Research fronts in library and information science in Spain (1985-1994). *Scientometrics*, **42** (2), 229-246.

Full Text: [1998\Scientometrics42, 229.pdf](1998/Scientometrics42,%20229.pdf)

Abstract: Publications and author cocitations in library and information science in Spain during the period from 1985 to 1994 were analyzed as a measure of the structure, specificity and composition of research fronts in this country. A cocitation matrix developed from an ad hoc database was subjected to cluster analysis, multidimensional scaling and principal components analysis. The resulting cocitation maps identified specific areas of research and their knowledge bases. we inferred the degree of consolidation of the discipline of library and information science, and of the subdisciplines informetrics, librarianship and university affiliation, from the research activities revealed. In this respect, the conclusions from the study show the existence of several research fronts in Spanish literature the contents of which are in most cases difficult to compare with those in other countries. A lesser degree of maturity of research in this field is shown.

Keywords: Analysis, Citation Analysis, Cluster, Cluster Analysis, Co-Citation, Cocitation, Composition, Indicators, Information, Information Science, Informetrics, Intellectual Structure, Knowledge, Library And Information Science, Principal Components, Principal Components Analysis, Research, Scaling, Science, Spain, Specificity, Structure

Friedrich, M.P. and Rodrigues, P.D. (1998), Looking at science in Brazilian universities: The case of the Instituto de Biofisica Carlos Chagas Filho. *Scientometrics*, **42** (2), 247-258.

Full Text: [1998\Scientometrics42, 247.pdf](1998/Scientometrics42,%20247.pdf)

Abstract: Performance indicators were built for the Institute de Biofisica Carlos Chagas Filho, one of the most well-reputed Brazilian science centers. The Institute’s performance presents a positive trend - articles number have doubled (1981-1995), and the articles impact grew from 4.20, in 1981, to 7.78, in 1990. This trend is probably being influenced by increasingly human resources involved in the Institute’s scientific activities and by the continuous growth of national and international collaboration. The follow up of indicators trends can be useful for the evaluation of long term policies directed to implement human resources programs and institutional collaborative work among scientific institutions.

Keywords: Collaboration, Evaluation, Follow up, Follow-up, Growth, Human, Impact, Indicators, Institutions, International Collaboration, Long-Term, Performance, Profile, Science, Scientific Institutions, Trend, Trends, Universities

Su, Y. and Han, L.F. (1998), A new literature growth model: Variable exponential growth law of literature. *Scientometrics*, **42** (2), 259-265.

Su, Y. and Han, L.F. (1998), A new literature growth model: Variable exponential growth law of literature. *Scientometrics*, **42** (2), 259-265.

Full Text: [1998\Scientometrics42, 259.pdf](1998/Scientometrics42,%20259.pdf)

Abstract: This article derives a ‘literature variable exponential growth model’ from Price’s literature growth model F(t) = ae(bt). The method is replacing bt by a polynomial of degree n-1. Our research shows that the new model is more convincing than the former ones. Detailed calculation procedure, examples, parameter values and mean square errors are given.

Keywords: Errors, Growth, Growth Model, Law, Model, New Model, Research

Beckmann, M. and Persson, O. (1998), The thirteen most cited journals in economics. *Scientometrics*, **42** (2), 267-271.

Full Text: [1998\Scientometrics42, 267.pdf](1998/Scientometrics42,%20267.pdf)

Abstract: A citation matrix for the thirteen most cited journals in economics is constructed from data in the Social Sciences Citation Index. (TM) The components of the eigenvector associated with the largest possible eigenvalue (the Frobenius root) of this matrix defines ‘impact values’ by which these journals may be ranked.

Keywords: Citation, Constructed, Data, Economics, Journals, Matrix

Radosevic, S. and Auriol, L. (1998), Measuring S & T activities in the former socialist economies of central and Eastern Europe: Conceptual and methodological issues in linking past with present. *Scientometrics*, **42** (3), 273-297.

Full Text: [1998\Scientometrics42, 273.pdf](1998/Scientometrics42,%20273.pdf)

Abstract: The economic and social transformation of countries of central and eastern Europe has deeply affected their S&T systems. However, conceptual and methodological problems in monitoring transformation of their S&T systems are not trivial. In this paper we analyse conceptual and methodological issues involved in measuring S&T activities in the socialist and post-socialist period across the most important S&T indicators (R&D, US and national patents, innovation surveys, bibliometrics). Our conclusions are that: i) the process of methodological harmonisation of S&T indicators has progressed considerably and we have provided some evidence in that respect, ii) the use of similar or identical indicators (business R&D, innovation counts, patents, citations) when making inter-country or inter- temporal comparisons should be approached with caution because of the significant differences between the socialist and post- socialist periods as well as between post-socialist R&D systems and R&D in other market economies. This latter applies especially to the interpretation of business R&D data in the post-socialist period

Keywords: Bibliometrics, Citations, Economic, Europe, Indicators, Innovation, International Collaboration, Monitoring, Paper, Patents, Process, Social, Surveys, Transformation, US

Hart, P.W. and Sommerfeld, J.T. (1998), Relationship between growth in gross domestic product (GDP) and growth in the chemical engineering literature in five different countries. *Scientometrics*, **42** (3), 299-311.

Full Text: [1998\Scientometrics42, 299.pdf](1998/Scientometrics42,%20299.pdf)

Abstract: Data were compiled and linearly correlated on the growth in the gross domestic product (GDP) with the academic chemical engineering literature over a recent 26-year period for five different English-speaking countries, namely, the United States, Canada, Great Britain, India and Australia. The publication figures were also scaled to the total number of chemical engineering schools in the country, furthermore, all of these data were normalized from zero to unity, using the figures far the most recent year (1996) as the denominators, and then correlated against each other in linear fashion. Resulting confidence levels were in excess of 99% for each of the individual five countries, as well as for the entire set of normalized data for all of the countries.

Keywords: Academic, Australia, Britain, Canada, Chemical, Confidence, Engineering, GDP, Great Britain, Growth, India, Journals, Levels, Linear, Publication, Recent, Schools, United States

Godin, B. (1998), Measuring knowledge flows between countries: The use of scientific meeting data. *Scientometrics*, **42** (3), 313-323.

Full Text: [1998\Scientometrics42, 313.pdf](1998/Scientometrics42,%20313.pdf)

Abstract: The present paper tries to compare international flows of knowledge as measured in meetings with flows as measured with papers in order to see what meetings can add to bibliometric studies. It is shown that most of known bibliometric results are confirmed with meetings, although more skewly: the concentration of proceedings, the dominance and attraction of the United States, and the decline of United Kingdom. However, important limitations are associated with ISTP, namely the low rate of authors’ addresses, a limitation which reduces the interest of ISTP for bibliometric studies.

Keywords: Bibliometric, Bibliometric Studies, Biotechnology, Communication, Concentration, Flows, Knowledge, Limitations, Low, Order, Paper, Participation, United Kingdom, United States

Gupta, B.M., Kumar, S. and Rousseau, R. (1998), Applicability of selected probability distributions to the number of authors per article in theoretical population genetics. *Scientometrics*, **42** (3), 325-334.

Full Text: [1998\Scientometrics42, 325.pdf](1998/Scientometrics42,%20325.pdf)

Abstract: Recently scientists have investigated what statistical distributions can be used to describe the distribution of the number of authors per article. Ajiferuke has undertaken the most comprehensive study of this problem. He has found that by and large the Inverse Gaussian-Poisson distribution could describe most properly the observed authorship distributions. However, it is well known that this distribution is rather intricate, so Rousseau tried to fit some simple one-parameter distributions to the number of authors of LIS articles. He has found that the geometric and the truncated Poisson distribution adequately describe these authorship data sets. The main purpose of the present paper is to continue these investigations and to analyse and test the viability of simple statistical distributions. As to (sub)felds where the single author dominates the results of Rousseau were corroborated: the truncated Poisson and the geometric distribution give often adequate fits to describe the number of authors. The Lotka distribution should be rejected. The truncated binomial distribution and the truncated negative binomial were investigated as well. However, it is not clear whether they are acceptable candidates.

Keywords: Authorship, Distribution, Distributions, Genetics, Investigations, Lotka Law, Paper, Population, Probability, Test, Viability

Gupta, B.M. (1998), Growth and obsolescence of literature in theoretical population genetics. *Scientometrics*, **42** (3), 335-347.

Full Text: [1998\Scientometrics42, 335.pdf](1998/Scientometrics42,%20335.pdf)

Abstract: Studies the relation between growth rates and obsolescence rates and half-life of theoretical population genetics literature. Explores the application of lognormal distribution in age distribution of citations over a period of time.

Keywords: Access, Age, Aging, Attention, Discard, Genetics, Information, Information Retrieval, Informetrics, Knowledge, Older, Population, Probability, Reviews, Storage, Time, Utility, Validity

? Gupta, B.M. and Karisiddappa, C.R. (1998), Collaboration in theoretical population genetics speciality. *Scientometrics*, **42** (3), 349-376.

Full Text: [1998\Scientometrics42, 349.pdf](1998/Scientometrics42,%20349.pdf)

Abstract: Analyses the growth of funded and collaborative research publications and authors as reflected in selected theoretical population genetics literature from 1956-60 to 1976-80. Indicates that the number of funded and collaborated publications has not proportionally increased along with the growth of total research publications and authors with time, but however, there is a strong correlation between the two. Indicates the extent of multi-authored research publications in different countries, and studies the growth of multi-authored publications from 1956-60 to 1976-80. Studies the impact of funding and collaboration on the productivity of authors over a period of time. Concludes that the authors who are more productive are generally found to be more collaborative and funded. The average productivity per author is observed to be larger in funded and collaborated authors subset and smaller in non-funded and non-collaborated authors subset, than the average productivity per author in the total authors subset in all the five block years studied. There is a systematic increase with time in the average productivity per author in the funded and collaborated authors subset. Studies the nature and type of collaborated research from 1956-60 to 1976-80, and the role of funding. Highlights the research priorities of few important countries in collaborative research. Indicates the collaboration linkages among various countries in transnational collaborative research. Concludes that with time, the focus of research is slowly shifting from internal collaboration to domestic and international collaboration, supported by increasing funding from government agencies in theoretical population genetics research.

Keywords: Collaboration, Correlation, Funding, Genetics, Growth, Impact, International Collaboration, Output, Population, Productivity, Publications, Research, Role

? Rivas, A.L., Deshler, J.D., Quimby, F.W., Mohammed, H.O., Wilson, D.J., Gonzalez, R.N., Lein, D.H. and Bruso, P. (1998), Interdisciplinary question generation: Synthesis and validity analysis of the 1993-1997 bovine mastitis-related literature. *Scientometrics*, **42** (3), 377-403.

Full Text: [1998\Scientometrics42, 377.pdf](1998/Scientometrics42,%20377.pdf)

Abstract: Interdisciplinary synthesis and validity analysis (ISVA), a structured learning approach which integrates teaming and communication theories, mete-analytic evaluation methods, and literature management-related technologies was applied in the context of the 1993-1997 bovine mastitis research literature. This study investigated whether ISVA could: 1) facilitate the analysis and synthesis of interdisciplinary knowledge claims, and a)generate projects or research questions. The bovine mastitis-related literature was conceptualized as composed of microbiological, immunological, and epidemiological dimensions. Keywords involving these dimensions were searched in the Medline and Agricola databases. A final list of 148 articles were retrieved, analyzed, synthesized into fifteen information sub-sets, and evaluated for construct, internal, external and statistical validity through an interdisciplinary iterative dialogical process. Validity threats were re-phrased as new research or educational projects.

Keywords: Analysis, Bovine, Communication, Databases, Decision-Support System, Endotoxin-Induced Mastitis, Evaluation, Flow Cytometric Analysis, Health-Monitoring-System, Information, Interdisciplinary, Knowledge, Lactating Dairy-Cows, Learning, Medline, Methods, Necrosis-Factor-Alpha, Online Electrical-Conductivity, Periparturient Holstein Cattle, Process, Research, Somatic-Cell Count, Staphylococcus-Aureus Mastitis, Synthesis, Technologies, Validity

? bd el Kader, M., Ojasoo, T., Miquel, J.F., Okubo, Y. and Dore, J.C. (1998), Hierarchical author networks: An analysis of European Molecular Biology Laboratory (EMBL) publications. *Scientometrics*, **42** (3), 405-421.

Full Text: [1998\Scientometrics42, 405.pdf](1998/Scientometrics42,%20405.pdf)

Abstract: Go-authorship analyses are both difficult to perform and interpret. We have devised a new way of calculating and representing hierarchical author networks that depict relationships among authors in a more exhaustive and less equivocal manner than most available automatic analyses. Any structure, however complex, can be broken down into independent subclusters of authors that can be represented as individual interconnected networks. We illustrate our approach by analysing the authors of publications giving the European Molecular Biology Laboratory (EMBL) as an affiliation in 1994 (from the ISI 1994 CD-ROM). The networks can be interpreted by referring to the official EMBL staff list (Annual Report 1993) and, in terms of research topics, by consulting the article titles and abstracts. In this respect, correspondence analyses of the author-publication matrices - that are the counterparts of the author-author matrices - prove extremely useful in structuring the thematic information. In fact, both methods - the hierarchical author networks and the correspondence analysis biplots - mutually enrich each other and provide a global picture of the inherent structure and interests of the EMBL as given by their 1994 publications.

Keywords: 48 Countries, Analysis, Cd-Rom, Collaboration, Complex, Contributors, Global, Information, ISI, Methods, Patterns, Period 1981-1992, Publications, Research, Science, Specialties, Structure, Typology

? Van Raan, A.F.J. (1998), The influence of international collaboration on the impact of research results - Some simple mathematical considerations concerning the role of self-citations. *Scientometrics*, **42** (3), 423-428.

Full Text: [1998\Scientometrics42, 423.pdf](1998/Scientometrics42,%20423.pdf)

Abstract: There is an ongoing discussion on the influence of international collaboration on impact as measured by citation-based indicators. Collaboration generally involves more authors than ‘no collaboration’ work and it is obvious that the phenomenon of self-citation will be stronger (there are more authors to cite themselves). Thus it can be seen as an important amplifier’ of measured impact. Although this effect is certainly possible and already demonstrated recently, it should not be considered as the only or even major explanation of higher impact in the comparison between ‘no collaboration’ and international collaboration. Using data of an extensive bibliometric study of astronomical research in the Netherlands, we prove that higher rates of self-citation in international collaboration do not play any significant role as ‘impact amplifier’. The central point is that proper impact measurement must involve corrections for self-citations.

Keywords: Bibliometric, Bibliometric Study, Collaboration, Comparison, Impact, Indicators, International Collaboration, Measurement, Research, Research Results, Role

? LeClerc, M. (1998), Science and technology - The Japanese marriage. *Scientometrics*, **42** (3), 429-434.

Full Text: [1998\Scientometrics42, 429.pdf](1998/Scientometrics42,%20429.pdf)

? Braun, T. (1998), Untitled. *Scientometrics*, **43** (1), 3.

Full Text: [1998\Scientometrics43, 3.pdf](1998/Scientometrics43,%203.pdf)

Leydesdorff, L. (1998), Theories of citation? *Scientometrics*, **43** (1), 5-25.

Leydesdorff, L. (1998), Theories of citation? *Scientometrics*, **43** (1), 5-25.

Full Text: [1998\Scientometrics43, 5.pdf](1998/Scientometrics43,%205.pdf)

Abstract: Citations support the communication of specialist knowledge by allowing authors and readers to make specific selections in several contexts at the same time. In the interactions between the social network of (first-order) authors and the network of their reflexive (that is, second-order) communications, a sub-textual code of communication with a distributed character has emerged. The recursive operation of this dual-layered network induces the perception of a cognitive dimension in scientific communication. Citation analysis reflects on citation practices. Reference lists are aggregated in scientometric analysis using one (or sometimes two) of the available contexts to reduce the complexity: geometrical representations (‘mappings’) of dynamic operations are reflected in corresponding theories of citation. For example, a sociological interpretation of citations can be distinguished from an information-theoretical one. The specific contexts represented in the modern citation can be deconstructed from the perspective of the cultural evolution of scientific communication.

Keywords: Analysis, Citation, Citations, Communication, Dynamic, Evolution, Indicators, Interactions, Knowledge, Model, Operation, Perception, Science, Scientific Communication, Scientometrics, Second Order, Social, Social Network, Support

Kostoff, R.N. (1998), The use and misuse of citation analysis in research evaluation: Comments on theories of citation? *Scientometrics*, **43** (1), 27-43.

Full Text: [1998\Scientometrics43, 27.pdf](1998/Scientometrics43,%2027.pdf)

Abstract: The present paper addresses some of the many possible uses of citations, including bookmark, intellectual heritage, impact tracker, and self-serving purposes. The main focus is on the applicability of citation analysis as an impact or quality measure. If a paper’s bibliography is viewed as consisting of a directed (research impact or quality) component related to intellectual heritage and random components related to specific self-interest topics, then for large numbers of citations from many different citing papers, the most significant intellectual heritage (research impact or quality) citations will aggregate and the random author-specific self-serving citations will be scattered and not accumulate. However, there are at least two limitations to this model of citation analysis for stand-alone use as a measure of research impact or quality. First, the reference to intellectual heritage could be positive or negative. Second, there could be systemic biases which affect the aggregate results, and one of these, the ‘Pied Piper Effect’, is described in detail. Finally, the results of a short citation study comparing Russian and American papers in different technical fields are presented. The questions raised in interpreting this data highlight a few of the difficulties in attempting to interpret citation results without supplementary information. Leydesdorff (Leydesdorff, 1998) addresses the history of citations and citation analysis, and the transformation of a reference mechanism into a purportedly quantitative measure of research impact/quality. The present paper examines different facets of citations and citation analysis, and discusses the validity of citation analysis as a useful measure of research impact/quality.

Keywords: Affect, Aggregate, Analysis, Citation, Citation Analysis, Citations, Evaluation, History, Impact, Information, Limitations, Mechanism, Misuse, Model, Paper, Quality, Reference, Research, Research Evaluation, Transformation, Validity

? Cronin, B. (1998), Metatheorizing citation - Comments on theories of citation? *Scientometrics*, **43** (1), 45-55.

Full Text: [1998\Scientometrics43, 45.pdf](1998/Scientometrics43,%2045.pdf)

Abstract: This paper reviews a variety of perspectives on citation. It argues that citations have multiple articulations in that they inform our understanding of the socio-cultural, cognitive, and textual aspects of scientific communication. Two metatheoretical frameworks are proposed as a means of negotiating the interpretative differences which characterize the various discourse communities concerned with citation theory and practice.

Keywords: Citation, Citations, Communication, Communities, Information-Science, Paper, Practice, Reviews, Scientific Communication, Theory

? Egghe, L. (1998), Mathematical theories of citation - Comments on theories of citation? *Scientometrics*, **43** (1), 57-62.

Full Text: [1998\Scientometrics43, 57.pdf](1998/Scientometrics43,%2057.pdf)

Abstract: The paper focusses on possible mathematical theories of citation and on the intrinsic problems related to it. It sheds light on aspects of mathematical complexity as e.g. encountered in fractal theory and Mandelbrot’s law. There is also a discussion on dynamical aspects of citation theory as reflected in evolutions of journal rankings, centres of gravity or of the set of source journals. Some comments are given in this connection on growth and obsolescence.

Keywords: Citation, Fractal Theory, Gravity, Growth, Impact, Journal, Journals, Law, Light, Obsolescence, Paper, Rankings, Set, Source, Theory

Rousseau, R. (1998), Citation analysis as a theory of friction or polluted air? Comments on theories of citation? *Scientometrics*, **43** (1), 63-67.

Full Text: [1998\Scientometrics43, 63.pdf](1998/Scientometrics43,%2063.pdf)

Abstract: It is argued that Leydesdorff’s theory of citations mixes the ideal or pure case with complicating factors. Ideally, citations are used as shorthand and for ethical reasons. The social network between scientists should be seen as a second-order correction on the basic model or, sometimes, even as noise. Metaphorically speaking Leydesdorff’s theory is not a theory about ideal gases, but about polluted air.

Keywords: Air, Analysis, Citation, Citations, Gases, Ideal, Model, Noise, Second Order, Social, Social Network, Theory

? Garfield, E. (1998), Random thoughts on citationology. Its theory and practice - Comments on theories of citation? *Scientometrics*, **43** (1), 69-76.

Full Text: [1998\Scientometrics43, 69.pdf](1998/Scientometrics43,%2069.pdf)

Abstract: Theories of citation are as elusive as theories of information science, which have been debated for decades. But as a basis for discussion I offer the term citationology as the theory and practice of citation, including its derivative disciplines citation analysis and bibliometrics. Several maxims, commandments if you will, have been enunciated. References are the result of a specialized symbolic language with a citation syntax and grammar. References, like words, have multiple meanings which are related to the aposteriori quality of citation indexes. Therefore, citation relevance cannot be predicted. Mathematical microtheories in bibliometrics abound, including the apposite laws of scattering and concentration. Citation behavior is a vast sub-set of citation theory, which like citation typology, can never be complete. Deviant citation behavior preoccupies certain authors but it is rarely significant in well-designed citation analyses, where proper cohorts are defined. Myths about uncitedness and the determinants of impact are discussed, as well as journal impact factors as surrogates and observation’s on scientists of Nobel Class. After two years at Johns Hopkins investigating ‘machine documentation,’ and another year as a student of library science, I became, fortuitously, a documentation consultant. By 1954, I called myself an information engineer, which was an apt description of my professional consulting activities. However, Pennsylvania licensing law requires that engineers be graduates of engineering schools. So I became an information scientist! I’ve never thought of myself as an information theoretician and have been skeptical about a need for a theory of information science. I’ve practiced information science and engineering without explicit theoretical support. But undoubtedly there are underlying principles which can guide information scientists who, like myself, could be called ‘citationists’ or ‘citationologists.’ If there is a theory and practice of citation, it should probably be called citationology.

Keywords: Analysis, Behavior, Bibliometrics, Citation, Citation Analysis, Citation Indexes, Concentration, Derivative, Engineering, Impact, Impact Factors, Information, Information Science, Journal, Journal Impact Factors, Language, Law, Practice, Quality, Schools, Science, Student, Support, Surrogates, Theory, Typology

? Fujigaki, Y. (1998), The citation system: Citation networks as repeatedly focusing on difference, continuous re-evaluation, and as persistent knowledge accumulation - Comments on theories of citation? *Scientometrics*, **43** (1), 77-85.

Full Text: [1998\Scientometrics43, 77.pdf](1998/Scientometrics43,%2077.pdf)

Abstract: It can be shown that claims of a lack of theories of citation are also indicative of a grate need for a theory which links science dynamics and measurement. There is a wide gap between qualitative (science dynamics) and quantitative (measurement) approaches. To link them, the present study proposes the use of the citation system, that potentially bridges a gap between measurement and epistemology, by applying system theory to the publication system.(1).

Keywords: Accumulation, Citation, Dynamics, Indicators, Knowledge, Measurement, Persistent, Publication, Qualitative, Science, Theory

Notes: IInstitute

Makino, J. (1998), Productivity of research groups: Relation between citation analysis and reputation within research communities. *Scientometrics*, **43** (1), 87-93.

Full Text: [1998\Scientometrics43, 87.pdf](1998/Scientometrics43,%2087.pdf)

Abstract: In this paper I discuss the relation between widely used ‘Scientometric’ measures and ‘reputation’ of research groups within the scientific community. To this goal, I present the result of the detailed comparison of two research groups of theoretical astrophysics in post-world-war-2nd Japan. Though one of the two groups gained much higher reputation within the research community, we could not find much difference in the macroscopic indices such as the number of publications or the average citation index. The two groups showed similar scores for these macroscopic indices. This result suggests that widely used quantitative measures of the productivity do not give meaningful measure for the actual contribution of a research group to science.

Keywords: Analysis, Citation, Citation Analysis, Communities, Community, Comparison, Goal, Group, Groups, Index, Japan, Paper, Productivity, Publications, Research, Science

? Scharnhorst, A. (1998), Citation - Networks, science landscapes and evolutionary strategies - Comments on theories of citation? *Scientometrics*, **43** (1), 95-106.

Full Text: [1998\Scientometrics43, 95.pdf](1998/Scientometrics43,%2095.pdf)

Abstract: The construction of virtual science landscapes based on citation networks and the strategic use of the information therein shed new light on the issues of the evolution of the science system and possibilities for control. Citations seem to have a key position in the retrieval and valuation of information from scientific communication networks. Leydesdorff’s approach to citation theory takes into account the dual-layered character of communication networks and the second-order nature of the science system. This perspective may help to sharpen the awareness of scientists and science policy makers for possible feedback loops within actions and activities in the science system, and probably nonlinear phenomena resulting therefrom. In this paper an additional link to geometrically oriented evolutionary theories is sketched and a specific landscape concept is used as a framework for some comments.

Keywords: Awareness, Bibliometrics, Citation, Cocitation Analysis, Communication, Concept, Control, Evolution, Feedback, Information, Key, Landscape, Light, Models, Nonlinear, Paper, Policy, Position, Science, Science Policy, Science-Policy, Scientific Communication, Second Order, Strategies, Theory, Valuation

? Vinkler, P. (1998), Comparative investigation of frequency and strength of motives toward referencing, the reference threshold model - Comments on theories of citation? *Scientometrics*, **43** (1), 107-127.

Full Text: [1998\Scientometrics43, 107.pdf](1998/Scientometrics43,%20107.pdf)

Abstract: Comparative investigation of frequency and strength of motives of authors toward referencing proves that references-citations can be used for exploring information links between items referencing and referenced. As referencing can be assumed as a peer evaluation process resulted in referencing some papers and neglecting others, citations obtained can be applied for assessing international impact of scientific publication activity.

Keywords: Activity, Bibliometric Analysis, Citation, Citations, Citer Motivations, Departments, Determinants, Evaluation, Impact, Indicators, Information, Information-Science, Investigation, Model, Motives, Obsolescence, Process, Publication, Publications, Quality, Reference, Referencing, Research Performance, Strength, Threshold

? Van Raan, A.F.J. (1998), In matters of quantitative studies of science the fault of theorists is offering too little and asking too much - Comments on theories of citation? *Scientometrics*, **43** (1), 129-139.

Full Text: [1998\Scientometrics43, 129.pdf](1998/Scientometrics43,%20129.pdf)

Abstract: In this paper we take position in the ‘citation theory’ debate. First we revisit relevant earlier work of our group and try to assemble the findings. We criticise the constructivist fashion in sociology of science concerning citation practices. With statistical arguments we show the strong limitations of any ‘citation theory’ at the ‘citer side’. We emphasize that citations should be conceived of as ‘binding properties’ of an individual publication, from which many types of structuring follow. As keywords also have such binding properties at the same time, and as there are empirically established relations between the citation domain and the word domain, it is useless to develop a model concerning citations only. We envisage an interesting development, both theoretically and empirically, of what we would like to call ‘bibliometric chemistry’.

Keywords: Bibliometric, Bibliometric Indicators, Binding, Citation, Citations, Combined Cocitation, Cum Laude Doctorates, Development, Group, Impact Factors, Limitations, Model, Ortega Hypothesis, Paper, Performance, Position, Properties, Publication, Science, Sociology of Science, Theory, Word Analysis

Arunachalam, S. (1998), Citation analysis: Do we need a theory? Comments on theories of citation? *Scientometrics*, **43** (1), 141-142.

Full Text: [1998\Scientometrics43, 141.pdf](1998/Scientometrics43,%20141.pdf)

Keywords: Analysis, Citation, Theory

? Small, H. (1998), Citations and consilience in science - Comments on theories of citation? *Scientometrics*, **43** (1), 143-148

Full Text: [1998\Scientometrics43, 143.pdf](1998/Scientometrics43,%20143.pdf)

Keywords: Citation, Science, Scientific Discovery

? Vinogradov, A.E. (1998), Secular trend of academician aging. *Scientometrics*, **43** (2), 149-160.

Full Text: [1998\Scientometrics43, 149.pdf](1998/Scientometrics43,%20149.pdf)

Abstract: The time-course of average age of members of the Russian Academy of Sciences in the XVIII-XIX centuries was analyzed. A long-term trend of academician aging was found, with its extrapolation correctly predicting the average age of the recent academicians. Although the lifespan was increasing as well and its effect can statistically explain the most part (up to 80%) of variance in the average age, it was not the only cause. Furthermore, its effect might be indirect (i.e, the increasing average age was not simply due to a longer lifespan of elected members), since average membership span was slightly decreasing. At least a part of the trend was caused by a growth of competition for election since it was negatively correlated with a contemporaneous number of members (at given lifespan and historical year). Comparison of three groups (full members, corresponding members and foreign members), differing in competition level, supports this suggestion. Besides the history of science, the results may be useful for dealing with the problem of growing age of the scientific establishment.

Keywords: Age, Aging, Competition, Groups, Growth, Historical, History, History of Science, Long-Term, Long-Term Trend, Predicting, Recent, Science, Supports, Trend

Cunningham, S.J. (1998), Applications for bibliometric research in the emerging digital libraries. *Scientometrics*, **43** (2), 161-175.

Full Text: [1998\Scientometrics43, 161.pdf](1998/Scientometrics43,%20161.pdf)

Abstract: Large numbers of research documents have recently become available on the Internet through ‘digital libraries’, and these collections are seeing high levels of use by their related research communities. A secondary use for these document repositories and indexes is as a platform for bibliometric research. We examine the extent to which the new digital libraries support conventional bibliometric analysis, and discuss shortcomings in their current forms. Interestingly, these electronic text archives also provide opportunities for new types of studies: generally the full text of documents are available for analysis, giving a finer grain of insight than abstract-only online databases, these repositories often contain technical reports or pre-prints, the ‘grey literature’ that has been previously unavailable for analysis, and document ‘usage’ can be measured directly by recording user accesses, rather than studied indirectly through document references.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Research, Communities, Current, Databases, Internet, Levels, Libraries, Research, Retrieval, Support

Pereira, J.C.R., Escuder, M.M.L. and Zanetta, D.M.T. (1998), Brazilian sciences and government funding at the State of Säo Paulo. *Scientometrics*, **43** (2) 177-188.

Full Text: [1998\Scientometrics43, 177.pdf](1998/Scientometrics43,%20177.pdf)

Abstract: The State of Sao Paulo plays an important role in national research activities. The Foundation for the Support of Research of Sao Paulo State (FAPESP) is commissioned to manage funds for these activities. The profile of Brazilian sciences is investigated and contrasted to FAPESP’s investments. ISI date relative to years 1981 to 1995 are analysed through multivariate methods (Factor and Cluster Analysis) as to provide weighted ranks of research fields, relationships among them as geometric distances, and group classification. This information is compared to public reports an FAPESP’s expenditures. Brazilian scientific production grows at 244 papers/year in the period, and its global share is almost doubled. impact shows no trend. Best performers are from exact and biological sciences. Though impact varies greatly among research fields, their major distinctive feature is magnitude of production. The six top research fields identified (Physics, Biology & Biochemistry, Clinical Medicine, Engineering, Chemistry, Plant & Animal Sciences) were found to equally be the prime beneficiaries FAPESP’s investments. The Brazilian scenario is one of increasing production under an international pattern. This trend is not accompanied by changes in impact. As a corollary, volume of publications rises as an important issue. Public investments from Sao Paulo State adequately conform this scenario giving reassurance that resources are not being squandered.

Keywords: Classification, Expenditures, Funding, Global, Government Funding, Group, Impact, Information, ISI, Methods, Multivariate, Production, Profile, Publications, Research, Role, Sciences, Scientific Production, Trend

Guzman, M.V., Sanz, E. and Sotolongo, G. (1998), Bibliometric study on vaccines (1990-1995). Part I: Scientific production in Iberian-American countries. *Scientometrics*, **43** (2), 189-205.

Full Text: [1998\Scientometrics43, 189.pdf](1998/Scientometrics43,%20189.pdf)

Abstract: Analysis of scientific production is made in the domains of vaccines for the period 1990-1995, including eight Iberian-American countries. To attain the results, different indicators were applied such as: collaboration rate, activity index and representation techniques, using a cluster analysis and multidimensional scaling. Similarities between countries are represented according to their activity index in the subject field. Results show a discontinuity in the scientific production over the years, whe re each country has a peculiar behavior.

Keywords: Activity, Analysis, Behavior, Cluster, Cluster Analysis, Collaboration, Index, Indicators, Made, Production, Representation, Scaling, Scientific Production, Techniques

? Golub, B. (1998), The Croatian scientific elite and its socio-professional roots. *Scientometrics*, **43** (2), 207-229.

Full Text: [1998\Scientometrics43, 207.pdf](1998/Scientometrics43,%20207.pdf)

Abstract: No matter how strong the intellectual and other psychological predispositions for top scientific achievement and/or a successful scientific career, neither the processes of a general and scientific socialisation nor the socio-cultural or socio-professional environment can be avoided or neglected. Empirical support for the thesis on the impact of the social environment on the formation and the influence of the scientific elite of a country is supported by three analysed research studies: on distinguished Croatian scientists (1995), on the population of Croatian scientists (1990) and on Croatian scientific emigrants (1986).

Keywords: Achievement, Environment, Formation, General, Impact, Matter, Population, Psychological, Research, Roots, Social, Social Environment, Support

Moed, H.F., Luwel, M., Houben, J.A., Spruyt, E. and Van den Berghe, H. (1998), The effects of changes in the funding structure of the Flemish universities on their research capacity, productivity and impact during the 1980’s and early 1990’s. *Scientometrics*, **43** (2), 231-255.

Full Text: [1998\Scientometrics43, 231.pdf](1998/Scientometrics43,%20231.pdf)

Abstract: This article addresses the following issues: How did external funding of Flemish academic research develop during the 1980’s and early 1990’s? What are the effects of the increase of external funding on the size and the composition of the research capacity in Flemish universities, and on research performance as reflected in bibliometric indicators? We present results of a quantitative analysis of 340 research departments in the natural and life sciences at three Flemish universities. We found that the externally funded research capacity increased strongly and is more and more concentrated in a limited number of departments. Departments with a high international standing have profited more from external funds than groups with a low impact In the class of departments showing the strongest increase in the externally funded research capacity, the ratio of the number of junior and senior scientists in these departments increased radically, while the publication productivity decreased. Our findings point towards the problem that if these trends continue to develop, a situation may emerge in which the basis normally provided by the university itself has become too small for externally funded research activities.

Keywords: Academic, Analysis, Bibliometric, Bibliometric Indicators, Capacity, Composition, Effects, Funding, Groups, Impact, Indicators, Life, Low, Natural, Performance, Productivity, Publication, Quantitative Analysis, Research, Research Performance, Sciences, Size, Structure, Trends, Universities

? Bar-Ilan, J. (1998), The mathematician, Paul Erdos (1913-1996) in the eyes of the Internet. *Scientometrics*, **43** (2), 257-267.

Full Text: [1998\Scientometrics43, 257.pdf](1998/Scientometrics43,%20257.pdf)

Abstract: Paul Erdos was a world famous Hungarian mathematician, who passed away in September 1996. Documents on the World Wide Web, mentioning Paul Erdos’s name were systematically collected. These documents were categorized using the method of content analysis. This work enables us to draw some conclusions about the ways authors of Internet documents picture Paul Erdos. This is the first work we know of that thoroughly examines the content of a huge collection of documents on a specific topic on the Internet.

Keywords: Analysis, Content Analysis, Internet, World Wide Web

? Prpic, K. (1998), Science ethics: A study of eminent scientists’ professional values. *Scientometrics*, **43** (2), 269-298.

Full Text: [1998\Scientometrics43, 269.pdf](1998/Scientometrics43,%20269.pdf)

Abstract: A questionnaire study of eminent scientists’ professional values was carried out within more extensive research of professional ethics. The structure of scientists’ professional values is composed of five factors: collegial and professorial responsibility, the protection of respondents or patients, wider social and professional responsibility, scientific precision and originality and scientific objectivity. The core of the scientists’ professional code consists of the values with the highest ratings. These are: cognitive standards which define the research role, explicit expectations of the scientists’ social responsibility, and requirements for excellence of scientific institutions and personnel. At the same time, significant differences have been found among the observed scientific fields. The largest discriminative power has been shown in the importance of precise measurements and then also in the protection of respondents and patients. These results question the traditional unitary concept of science, but also the concept of intellectual and social atomisation of scientific disciplines and fields.

Keywords: Concept, Core, Determinants, Ethics, Importance, Institutions, Measurements, Patients, Precision, Productivity, Protection, Quality, Questionnaire, Requirements, Research, Responsibility, Role, Science, Scientific Institutions, Social, Social Responsibility, Standards, Structure

? Plaza, L.M. (1998), The use of multiple databases in the assessment of research. An application in the field of plant science. *Scientometrics*, **43** (2), 299-304.

Full Text: [1998\Scientometrics43, 299.pdf](1998/Scientometrics43,%20299.pdf)

Abstract: This paper argues the convenience of considering multiple databases in order to obtain a reliable set of scientific indicators in case of fields that includes a variety of disciplines. With this aim we analyse the Spanish scientific output in Plant Sciences regarding mainstream literature covered by SCI database and that published in domestic journals covered by ICYT database. This method allows us to obtain two different profiles of research. These results clearly underly the need to consider these databases jointly, thus avoiding potential inaccuracies induced by the use of the SCI as the only information source to be considered for the assessment of research.

Keywords: Assessment, Databases, Indicators, Information, Order, Output, Paper, Plant, Profiles, Research, SCI, Science, Scientific Output, Source

? Babu, A.R. and Singh, Y.P. (1998), Determinants of research productivity. *Scientometrics*, **43** (3), 309-329.

Full Text: [1998\Scientometrics43, 309.pdf](1998/Scientometrics43,%20309.pdf)

Abstract: Earlier researchers like Turkeli, suggested that the factors which determine the productivity of scientists are admittedly complex and perhaps not amenable to real scientific analysis’. The present investigation was designed with the sole purpose of confronting such a complex problem. Nearly 200 variables influencing research productivity were collected through relevant literature, analysis of biographies of great scientists, and discussion with eminent scientists. Finally, through a critical examination, 80 variables were selected for the use of Q-sort technique. The sample for the study consisted of a cross section of scientists ranging from Fellows of Indian National Science Academy to young agricultural scientists. Mailed questionnaires and personal interview methods were used for collecting data. Out of a total of 912 respondents, reply was obtained from 325. On the basis of Q-sorted data, 26 variables were selected for further analysis and they were subjected to principal component factor analysis. The results indicated eleven factors affecting research productivity of scientists. They were: persistence, resource adequacy, access to literature, initiative, intelligence, creativity, learning capability, stimulative leadership, concern for advancement, external orientation, and professional commitment.

Keywords: Access, Adequacy, Agricultural, Analysis, Commitment, Complex, Examination, Factor Analysis, Interview Methods, Invention, Investigation, Leadership, Learning, Methods, Orientation, Persistence, Productivity, Questionnaires, Research, Research Productivity, Scientific Performance

? Banerjee, P. (1998), Indicators of ‘innovation as a process’. *Scientometrics*, **43** (3), 331-357.

Full Text: [1998\Scientometrics43, 331.pdf](1998/Scientometrics43,%20331.pdf)

Abstract: Innovation as a process is related to the business viewed as a process. A process cannot be captured through the indicators of input/output, which are the most commonly accepted variables. Indicators of technological characteristics also limit the scope of measurement. Moreover, these indicators have often to be constructed upon non-gaussian variables that are not amenable to additive operations. This paper identifies a methodology to identify process innovation variables, some of which are gaussian and some are not. A few simple indicators are then constructed, using additive operations, upon both additive and non-additive variables. The additive variables yield generalisable indicators and the non-additive Variables yield self-assessment type indicators. Bath types can be used as process performance measurement systems. Examples of the values that these indicators take up, have been shown for nine firms. This vindicates the assumption on the applicability of these indicators.

Keywords: Additive, Characteristics, Indicators, Innovation, Measurement, Methodology, Non-Additivity, Paper, Performance, Process, Quantitative-Analysis, Science, Scientific Activities, Self Assessment, Yield

? Bhattacharya, S. and Basu, P.K. (1998), Mapping a research area at the micro level using co-word analysis. *Scientometrics*, **43** (3), 359-372.

Full Text: [1998\Scientometrics43, 359.pdf](1998/Scientometrics43,%20359.pdf)

Abstract: The present study investigates the use of co-word analysis method to understand the micro structure of a research speciality. This study is done in the area of Condensed Matter Physics (CMP) taking two time-periods, 1990 and 1995. Based on concurrent set of journals occurring in the subject heading list of CMP in these two time-periods, a database is created after downloading articles present in these journals from the INSPEC database. Using words extracted from the titles from the created database, suitable co-word pairs are constructed. These words, and co-word pairs are explored further to understand their linkages with each other through network analysis methods. Dynamics, within the CMP across 1990 and 1995, are investigated through the comparison of the words, co-word pairs and structurally equivalent blocks. The results are projected using multi-dimensional scaling. The important conclusions of this study are discussed.

Keywords: Analysis, Co-Word Analysis, Comparison, Methods, Research, Scaling, Scientometrics, Structure

? Chawla, A. and Singh, J.P. (1998), Organizational environment and performance of research groups - A typological analysis. *Scientometrics*, **43** (3), 373-391.

Full Text: [1998\Scientometrics43, 373.pdf](1998/Scientometrics43,%20373.pdf)

Abstract: In this paper an attempt is made to construct a typology of research units according to a set of organizational features and relate the resulting classification to a set of performance measures. The organizational features include (i) Resources and facilities for research, (II) Communication and transfer of new ideas, (iii) Planning and organization of research, and (iv) Social psychological environment for research. The performance measure include (i) General R&D effectiveness, which essentially connotes the quality dimension of research performance, (II) Recognition of the work of the research unit by the scientific community, (iii) User-oriented effectiveness, and (iv) Administrative effectiveness (budget and schedule compliance). This study is based on the subset of empirical data on 220 research units collected in India for the third round of the UNESCO International Comparative Study on the Organization and Performance of Research Units (ICSOPRU). Twenty three measures of organizational environment, operationalized by multiple indicators, were chosen as discriminant criteria for the construction of the typology, using a classification computer programme SYSTIT (Systeme’ de Typologie Iterative). The relationship between typology groupings and performance measures was analyzed through multiple correspondence analysis. This study brings out that resources and facilities for research are a necessary but not a sufficient condition of performance. The sufficiency condition implies a positive work environment, effective communication within and outside the research group and a conceptually exciting research programme.

Keywords: Analysis, Budget, Classification, Co-Citations, Communication, Community, Compliance, Condition, Effective, Effectiveness, Environment, Features, Group, Groups, India, Indicators, Made, Organizational, Paper, Performance, Performance Measures, Psychological, Quality, Research, Research Performance, Science, Transfer, Typology

? Chetal, R. and Raj, A. (1998), Sponsored R & D in India: The project sponsoring pattern and main outcome of projects sponsored by major central departments/agencies. *Scientometrics*, **43** (3), 393-421.

Full Text: [1998\Scientometrics43, 393.pdf](1998/Scientometrics43,%20393.pdf)

Abstract: This paper examines the project sponsoring pattern and the outcome of extramural R&D with respect to the projects sponsored by country’s eleven central agencies during the Seventh Five-Year Plan period. The outcome considered are: contribution of R&D support to development of R&D facilities at the recipient institutions, creation of employment through project posts, development of new technologies, quantum and quality of research publications and. generation of doctoral thesis. The paper concludes that sponsored R&D has largely remained one-way flow of funds to a preferred set of institutions (as perceived by each sponsoring agency) and the outcome of the R&D have also remained unexamined by the respective funding agencies. The paper advocates development of a monitoring system which would help in enhancing the utilisation of sponsored R&D and its overall impact on science, society and economy.

Keywords: Creation, Development, Economy, Flow, Funding, Impact, India, Institutions, Monitoring, Outcome, Paper, Publications, Quality, Research, Science, Support, Technologies

Dhawan, S.M. (1998), Comparative study of physics research in India and China based on INSPEC-Physics for 1990 and 1995. *Scientometrics*, **43** (3), 423-441.

Full Text: [1998\Scientometrics43, 423.pdf](1998/Scientometrics43,%20423.pdf)

Abstract: The status of physics research in India and China has been examined by using bibliometric indicators. The study is based on publication data drawn from INSPEC-Physics for 1990 and 1995. China is ahead of India in terms of publication output. It ranks 7th in the world, whereas India is placed at 10th position. China is also ahead of India in terms of growth in its publications appearing particularly in the SCI (Science Citation Index) indexed journals. Despite its second position in publication count, India leads China in terms of average impact per paper computed using data on impact factor of the citing journals. It maintains this leading position both in 1990 and 1995. In addition, the study suggests a strategy for identifying leading areas of research in physics.

Keywords: Bibliometric, Bibliometric Indicators, China, Growth, Impact, Impact Factor, India, Indicators, Output, Paper, Position, Publication, Publications, Research, SCI, Science Citation Index, Strategy

Garg, K.C. and Padhi, P. (1998), Scientometric study of laser patent literature. *Scientometrics*, **43** (3), 443-454.

Full Text: [1998\Scientometrics43, 443.pdf](1998/Scientometrics43,%20443.pdf)

Abstract: An analysis of the patents filed and scientific papers published and abstracted in the Journal of Current Laser Abstracts (JCLA) for the period 1967-95 indicates that innovative activity in laser science and technology was at its peak in the early 70s. However, scientific activity surpassed the innovative activity in the early 80s. There was a continuous shift in emphasis from ‘applications of lasers’ to ‘experimental laser research’ and to ‘theoretical laser research’. Further analysis of the 1840 patents filed in 1970- 71, 1975-76, and 1980-85 indicates that most of the firms filing patents were situated in USA and thus USA is the leading country filing patents in this area followed by Japan. ‘Spectroscopy of laser output’ followed by ‘Communication applications of laser’ got the maximum emphasis.

Keywords: Activity, Analysis, Applications, Indicators, Japan, Patents, Science, Statistics, USA

? Kretschmer, H. and Gupta, B.M. (1998), Collaboration patterns in theoretical population genetics. *Scientometrics*, **43** (3), 455-462.

Full Text: [1998\Scientometrics43, 455.pdf](1998/Scientometrics43,%20455.pdf)

Abstract: The paper points out that the characteristic properties of general social networks are reflected in co-authorship patterns of theoretical population genetics as studied from 1900 to 1980. The results are consistent with the analyses of bibliographies where the co-authorship networks in invisible colleges probably have shown the same behavioural patterns as the non-scientific populations. The patterns of behaviour are portrayed in two-dimensional as well as three-dimensional representations of co-authorship data in theoretical population genetics.

Keywords: Co-Authorship, Co-Authorship Networks, General, Genetics, Paper, Parameters, Population, Properties, Social, Social Networks, Three-Dimensional

? Braun, T. (1999), Scientometrics research in India part II. *Scientometrics*, **44** (1), 3.

Full Text: Scientometrics44, 3.pdf

Keywords: India, Research

Gupta, B.M., Sharma, P. and Kumar, S. (1999), Growth of world and Indian physics literature. *Scientometrics*, **44** (1), 5-16.

Full Text: [1999\Scientometrics44, 5.pdf](1999/Scientometrics44,%205.pdf)

Abstract: The paper deals with the nature of growth models currently used in the literature for modeling the growth of publications. It introduces briefly three growth models and explores the applicability of these models in the growth of world and Indian physics literature. The analysis suggests that the growth of Indian physics literature follows a logistic model, while the growth of world physics literature is explained by a combination of logistic and power models. The criteria for selection of growth models based on the new growth rate functions suggested by Egghe and Ravichandra Rao are given. The methodology suggested by Egghe and Ravichandra Rao is shown to work satisfactorily, except for longer time series growth data, when we may have to restore to data splitting approach, if suggested by the plots of new growth rate functions. This approach helped us to use a combination of two growth models instead of one, to explain the growth of world physics literature.

Keywords: Analysis, Growth, Growth Rate, Methodology, Model, Modeling, Models, Paper, Publications, Selection, Time-Series

? Gupta, V.K. (1999), Technological trends in the area of fullerenes using bibliometric analysis of patents. *Scientometrics*, **44** (1), 17-31.

Full Text: [1999\Scientometrics44, 17.pdf](1999/Scientometrics44,%2017.pdf)

Abstract: Patents are a useful source of scientific and technological information. The bibliometrics analysis of patents has been made to identify technological trends in the area of fullerenes and study other parameters like growth of the patenting activity, active players in the field from industry, academia and government research institutions. It indicates that firms and R&D organisations in developing countries could undertake similar study on specific topics of their interests and obtain relevant insights.

Keywords: Activity, Analysis, Bibliometric, Bibliometric Analysis, Bibliometrics, Developing Countries, Fullerenes, Growth, Information, Institutions, Made, Parameters, Patents, Research, Source, Trends

? Sangam, S.L. (1999), Obsolescence of literature in the field of psychology. *Scientometrics*, **44** (1), 33-46.

Full Text: [1999\Scientometrics44, 33.pdf](1999/Scientometrics44,%2033.pdf)

Abstract: Bibliometric technique of citation analysis was applied to the data of five psychological periodical literature. The distribution of citations frequencies was statistically tested and the obsolescence factors were determined. The relation between the growth and obsolescence has been studied, and it has been observed that ‘higher the growth of literature, higher the obsolescence as well as higher the half life.’.

Keywords: Age, Analysis, Citation, Citation Analysis, Citations, Distribution, Growth, Psychological, Psychology

? Satyanarayana, K., Srivastava, D. and Sreenivas, V. (1999), The relevance of short communication in scholarly journals: An empirical study. *Scientometrics*, **44** (1), 47-58.

Full Text: [1999\Scientometrics44, 47.pdf](1999/Scientometrics44,%2047.pdf)

Abstract: This study aims to examine whether rapid communications exert more influence/impact on subsequent research. Citation analysis of Short Communications (SCs) and Main Articles (MAs) from 1983 and 1990 for 5 high impact biomedical journals was carried out for a five year period following publication. The mean citations cumulated for the five year period showed no consistent trend. Some journals showed more citations for SCs while some showed more for MAs. The mean citations (range) for SCs and MAs for the 1983 and 1990 papers respectively were as follows: Gene: 14.13 (0-61) and 38.79 (0-677), 9.73 (0-93) and 13.17 (0-44), Journal of Clinical Investigation (JCI): 49.77 (3-202) and 27.52 (0-86), 50.52 (0-254) and 33.53 (0-151), Journal of Experimental Medicine (JEM): 39.80 (0-200) and 49.20 (0-403), 47.26 (0-258) and 50.27 (0-173), and Journal of Biological Chemistry (JBC): 36.21 (0-380) and 19.67 (0-53), 37.19 (0-273) and 26.84 (0-185). SCs of Journal of Cell Biology (JCB) had a mean citation of 25.84 per article with a range of 0-98, while the MAs had a mean citation of 33.13 with the range 4-122 during 1983-87. The citation peak was seen about three years after publication for all the journals during both the periods. The mean cumulative citations showed a progressive increase over the five years for both types of papers, in all journals and for both the 5 year periods. The initial differences observed persisted even four years after the year of publication. No significant differences were observed in the distribution of the cumulative 5 year citations between the SCs and MAs. An index of speed of citation per article showed no substantial differences between SCs and MAs with MAs showing an edge over SCs. Both MAs and SCs of all the journals showed nearly same average time per citation per article further confirming that the SCs do not enjoy the advantage of speedier citation. The results show that the generally perceived feeling of SCs getting cited more frequently and faster does not appear to be valid. Hence, the practice of publishing SCs on a priority basis is perhaps not warranted.

Keywords: Analysis, Biomedical Journals, Citations, Communication, Distribution, Impact, Index, Practice, Publication, Publishing, Range, Research, Speed, Trend

Seetharam, G. and Rao, I.K.R. (1999), Growth of food science and technology literature: A comparison of CFTRI, India and the world. *Scientometrics*, **44** (1), 59-79.

Full Text: [1999\Scientometrics44, 59.pdf](1999/Scientometrics44,%2059.pdf)

Abstract: An attempt has been made to trace and compare the trends in growth of Food Science and Technology (FST) literature (periodical articles, patents, standards, theses and dissertations) produced by CFTRI scientists, by food scientists in India and by food scientsts of the world, covering a period between 1950 and 1990, to identify the best fitting growth models for actual and cumulative growth of data through regression analysis, and alpha(t) and alpha(2t) analysis, and to compute and compare the growth rates of FST documnets.

Keywords: Analysis, Comparison, Fitting, Food, Growth, Growth Rates, India, Law, Made, Models, Patents, Regression, Regression Analysis, Science, Standards, Trends

Srinivasan, R., Raman, V., Meyyappan, N. and Pichappan, P. (1999), Assessment of the impact of the journal literature produced by Indian CSIR laboratories using subfield corrected impact. *Scientometrics*, **44** (1), 81-92.

Full Text: [1999\Scientometrics44, 81.pdf](1999/Scientometrics44,%2081.pdf)

Abstract: Comparative assessment of the journal literature produced by laboratories, institutions working in different fields is a difficult exercise. The impact factor of the journals is not a suitable indicator since citation practices vary with fields. The variation is corrected in this study using a measure, the ‘subfield corrected impact factor’ and it is applied to the journal papers produced by the Indian Council of Scientific and Industrial Research Laboratories. This measure helped to compare the impact of journal literature in different fields

Keywords: Assessment, Bibliometric Indicators, Citation, Exercise, Impact, Impact Factor, Indicator, Journal

Tapaswi, M.P. and Maheswarappa, B.S. (1999), Ranking serials in oceanography: An analysis based on the Indian contributions and their citations. *Scientometrics*, **44** (1), 93-127.

Full Text: [1999\Scientometrics44, 93.pdf](1999/Scientometrics44,%2093.pdf)

Abstract: An analysis of serials preferred and cited in various communications by the Indian oceanographers during 1963 to 1992 is presented. A shift in preference of serials from general sciences to oceanography (interdisciplinary) and to core subject in oceanography is noticed. The contributions to Indian serials showed a decrease. The implications of this trend are discussed. The rank list of serials cited by Indian oceanographers was correlated with the rank list of serials cited at international level. A negative correlation with a marginal difference of -0.214 is observed between these two rank lists. This difference is attributed to studies from different geographical areas in these two rank sets. Bradford graphs for all datasets, but one, showed typical Bradford-Leimkuhler curves with or without clear Groos droops. Further research is required to explain this exceptional curve. A country-wise analysis of the serials preferred as well as cited in communications give a clear picture on the shift during the period of study. English is considered as the lingua franca by Indian oceanographers.

Keywords: Analysis, Citations, Core, Correlation, General, Interdisciplinary, Oceanography, Preference, Rank, Research, Sciences, Serials, Trend

? Gupta, B.M. and Karisiddippa, C.R. (1999), Collaboration and author productivity: A study with a new variable in Lotka’s law. *Scientometrics*, **44** (1), 129-134.

Full Text: [1999\Scientometrics44, 129.pdf](1999/Scientometrics44,%20129.pdf)

Abstract: The paper explores the possibility of using a new variable represented by the number of collaborators per author as a substitute for the number of papers in Lotka’s distribution to predict the productivity strata. On the basis of a case study in theoretical population genetics it is concluded that the number of collaborators per author has not proved to be a good substitute in the Lotka’s distribution, which is in contrast to Qin’s results.

Keywords: Case Study, Distribution, Genetics, Law, Lotka’s Law, Paper, Population, Predict, Productivity

? Saam, N.J. and Reiter, L. (1999), Lotka’s law reconsidered: The evolution of publication and citation distributions in scientific fields. *Scientometrics*, **44** (2), 135-155.

Full Text: [1999\Scientometrics44, 135.pdf](1999/Scientometrics44,%20135.pdf)

Abstract: This paper reports early steps in research that seeks to clarify how publications of scientists interact dynamically with citations and reputation in shaping the evolution of scientific fields. We assume that Lotka’s modified law holds for scientific fields. A primary approach to model publication productivity was published by Yablonsky. In contrast to Yablonsky’s unfinished mathematical approach, our simulation approach is not predominantly driven by insight into the formal generation mechanisms of certain processes but more theory driven. It considers the evolution of publication and citation distributions over the histories of scientific fields using both simulated and real historical data.

Keywords: Ambiguity, Citation, Citations, Distributions, Evolution, Historical, Indicators, Informetric Distributions, Law, Lotka’s Law, Mechanisms, Model, Modified, Paper, Productivity, Publication, Publications, Research, Simulation, Theory

Nunes, E.D. (1999), A review of research studies conducted on scientific production in collective health in Brazil. *Scientometrics*, **44** (2), 157-167.

Full Text: [1999\Scientometrics44, 157.pdf](1999/Scientometrics44,%20157.pdf)

Abstract: This paper presents a review of the principal studies conducted on scientific production in Brazil related to Public Health/Collective Health. Some of the findings highlighted in this study, show the progress of this area in terms of production of articles, doctorate theses, dissertations and publications.

Keywords: Brazil, Health, Paper, Production, Publications, Research, Review, Scientific Production

Leydesdorff, L. and Wouters, P. (1999), Between texts and contexts: Advances in theories of citation? (a rejoinder). *Scientometrics*, **44** (2), 169-182.

Full Text: [1999\Scientometrics44, 169.pdf](1999/Scientometrics44,%20169.pdf)

Abstract: Scientific literature is expected to contain a body of knowledge that can be indexed and retrieved using references and citations. References are subtexts which refer to a supertext, that is, the body of scientific literature. The Science Citation Index has provided an electronic representation of science at the supertextual level by aggregating the subtextual citations. As the supertext, however, becomes independently available in virtual reality (as a ‘hypertext’), subtext and supertext become increasingly different contexts. The dynamics of hyperlinks are expected to feedback on the system of indexing, referencing, and retrieval at the level of research practices. References can be considered as part of the retention mechanism of this evolving system of scientific communication, and citations are a codified form of referencing.

Keywords: Citation, Citations, Co-Words, Communication, Dynamics, Feedback, Hyperlinks, Indicators, Knowledge, Mechanism, Referencing, Representation, Research, Retention, Retention Mechanism, Science, Science Citation Index, Scientific Communication, Scientometrics, Virtual Reality

Lewison, G. and Igic, R. (1999), Yugoslav politics, ‘ethnic cleansing’ and co-authorship in science. *Scientometrics*, **44** (2), 183-192.

Full Text: [1999\Scientometrics44, 183.pdf](1999/Scientometrics44,%20183.pdf)

Abstract: Scientific outputs from Serbia, Croatia and Slovenia, and the patterns of co-authorship between them and five western countries and with each other have been determined from the Science Citation Index. They reflect accurately the political situation underlying the recent breakup of the former Yugoslavia, and long-term international alliances and friendships, but also take account of geographical proximity, which assists scientific co-operation. There is no evidence of changes in the ethnic composition of Serbian and Croatian scientists overall, as revealed by the names of their researchers before and after the civil war. However some changes appear to have taken place in Serbia outwith Belgrade, which are consistent with the reports of the expulsion of Croats living in Vojvodina.

Keywords: Co-Authorship, Composition, Croatia, Long-Term, Politics, Recent, Science, Science Citation Index, War

Hicks, D. (1999), The difficulty of achieving full coverage of international social science literature and the bibliometric consequences. *Scientometrics*, **44** (2), 193-215.

Full Text: [1999\Scientometrics44, 193.pdf](1999/Scientometrics44,%20193.pdf)

Abstract: This review of social science bibliometric literature seeks to establish characteristics of the social science literature and to understand their consequences for the coverage of literature databases and for interpretation of bibliometric social science indicators based on such databases. The paper reviews what we know about social science publishing and database coverage of it. It examines the main reasons why social science bibliometrics are problematic, namely: the centrality of books in social science literature and their high citation rate, and the national orientation of social science literatures. The paper then looks at reasons why social science bibliometrics holds increasing promise, namely: increasing internationalization, and good coverage of scholarly journals.

Keywords: Behavioral-Sciences, Bibliometric, Bibliometrics, Characteristics, Citation, Consequences, Databases, Economics, Humanities, Indicators, Knowledge, Orientation, Paper, Philosophy, Publishing, Research Performance, Review, Reviews, Science, Social, Sociology, Universities

? Ruiz-Baños, R., Bailón-Moreno, R., Jimenez-Contreras, E. and Courtial, J.P. (1999), Structure and dynamics of scientific networks. Part I: Fundamentals of the quantitative model of translation. *Scientometrics*, **44** (2), 217-234.

Full Text: [1999\Scientometrics44, 217.pdf](1999/Scientometrics44,%20217.pdf)

Abstract: The fundamentals have been developed for a quantitative theory on the structure and dynamics of scientific networks. These fundamentals were conceived through a new vision of translation, defined mathematically as the derivative or gradient of the quality of the actors as a function of the coordinates for the space in which they perform. If we begin with the existence of a translation barrier, or an obstacle that must be overcome by the actors in order to translate, and if we accept the Maxwell-Boltzmann distribution as representative of the translating capacity of the actors, it becomes possible to demonstrate the known principle of ‘success breeds success. We also propose two types of elemental translations: those which are irreversible and those which are in equilibrium. In addition, we introduce the principle of composition, which enables, from elemental translations, the quantification of more complex ones.

Keywords: Barrier, Capacity, Complex, Composition, Derivative, Distribution, Dynamics, Equilibrium, Function, Model, Order, Quality, Quantification, Scientific Networks, Structure, Theory, Vision

? Ruiz-Baños, R., Bailón-Moreno, R., Jimenez-Contreras, E. and Courtial, J.P. (1999), Structure and dynamics of scientific networks. Part II: The new Zipf’s Law, the clusters of co-citations and the model of the descriptor presence. *Scientometrics*, **44** (2), 235-265.

Full Text: [1999\Scientometrics44, 235.pdf](1999/Scientometrics44,%20235.pdf)

Abstract: Here, the quantitative theory of translation is shown to be of great utility in describing scientific networks. In fact, we deduce a new Zipf’s Law for the descriptors of a set of documents, based on the concepts of centres of interest and of irreversible parallel translations. This new law can be generalized to other phenomena, such as the distribution of the sizes of cocitation clusters. Finally, we have established the model, for descriptor presence in a network, which closely fits the values recorded.

Keywords: Clusters, Cocitation, Distribution, Dynamics, Law, Model, Scientific Networks, Theory, Utility

Schubert, A. (1999), Scientometrics: A citation based bibliography 1994-1996. *Scientometrics*, **44** (2), 267-291.

Full Text: [1999\Scientometrics44, 267.pdf](1999/Scientometrics44,%20267.pdf)

Keywords: Citation

? Moed, H.F. (1999), Selected proceedings of the Fifth International Conference on Science and Technology Indicators - Hinxton (Cambridge), UK - June 4-6, 1998 - Introduction. *Scientometrics*, **44** (3), 319-321

Full Text: [1999\Scientometrics44, 319.pdf](1999/Scientometrics44,%20319.pdf)

Keywords: UK

? Bassecoulard, E. and Zitt, M. (1999), Indicators in a research institute: A multi-level classification of scientific journals. *Scientometrics*, **44** (3), 323-345.

Full Text: [1999\Scientometrics44, 323.pdf](1999/Scientometrics44,%20323.pdf)

Abstract: Indicators in a research Institute ought to be readable at several decision levels, and particularly with different break-downs of the publication set chosen as reference. Citation transactions between journals have been widely used to structure scientific subfields in ISI databases. We tried a seed-free structuration of SCI/CMCI journals (a) to test convergence of pure citation-built specialties (roughly 150) on SCI/CMCI journals with existing classifications at the subfield level (b) to explore the interest and the limits of this approach for upper levels of aggregation (roughly 30 fields). PI few limits of journal-level classification are addressed. At the subfield level, the convergence is large with some discrepancies worth noticing. At the subdiscipline level, the method is not sufficient to achieve a satisfactory 30-level delineation, but gives a good basis for informed expert validation.

Keywords: Aggregation, Citations, Classification, Databases, ISI, Levels, Matrices, Publication, Reference, Research, Science, Structure, Test, Upper, Validation

Basu, A. (1999), Science publication indicators for India: Questions of interpretation. *Scientometrics*, **44** (3), 347-360.

Full Text: [1999\Scientometrics44, 347.pdf](1999/Scientometrics44,%20347.pdf)

Abstract: We comment on a letter to Nature in 1996 on the long term decline of Indian science pointing out methodological reasons why the (SCI) data used by the authors do not unambiguously lead to their stated conclusions. Our arguments are based on the contention that no valid statement on change in a country’s output may be made for a period in which the journal coverage from that country in SCI has changed significantly. We have suggested that for longitudinal comparisons of country level performance, it should be verified that the journals from that country in SCI remained constant within the period. This could be ensured if the country of publication of journals could be included as a field in the SCI database. We define a Visibility Index as the cumulated impact and derive a relation to estimate change in visibility combining changes in output and average impact. In the period during which Indian journal coverage remained unchanged, a detailed analysis of output for two years (1990-94) leads us to conclude that, with the exception of Agriculture, there has been an increase in publication in virtually every field, with significant increase in the-overall mean Impact Factor. At least 25 subfields have been identified with statistically significant increase in mean Impact Factor and Visibility. The impact of foreign collaboration on visibility has also been considered. In conclusion we touch upon the question of citation as a performance indicator for Third World countries as high citation and relevance may be in conflict as objectives.

Keywords: Analysis, British Science, Citation, Collaboration, Decline, Impact, India, Indicator, Indicators, Journal, Lead, Long-Term, Longitudinal, Made, Output, Performance, Performance Indicator, Publication, SCI, Science, Visibility

? Bonitz, M., Bruckner, E. and Scharnhorst, A. (1999), The Matthew Index - Concentration patterns and Matthew core journals. *Scientometrics*, **44** (3), 361-378.

Full Text: [1999\Scientometrics44, 361.pdf](1999/Scientometrics44,%20361.pdf)

Abstract: In this paper we extend our studies to the micro-structure of the Matthew effect for countries (MEC). The MEC allows the ranking of countries by their Matthew Index. The rank distribution of countries, observable only at a macro-level, has its roots in re-distribution processes of citations in every journal of the database. These re-distributed citations we call Matthew citations. Data for 44 countries and 2712 journals (based on the Science Citation Index) are analyzed. The strength of the contribution of the individual journals to the MEC (their number of Matthew citations) is skewly distributed. Due to this high concentration of the MEC we are able to define a new type of journal: the Matthew core journal: 145 Matthew core journals account for 50% of the MEG. These journals carry a high potential of gaining a surplus of citations over what is expected and the risk of losing a high number of citations as well.

Keywords: Citations, Concentration, Core, Countries, Distribution, Journal, Microstructure, Paper, Rank, Ranking, Risk, Roots, Science, Science Citation Index, Strength

Debackere, K., Luwel, M. and Veugelers, R. (1999), Can technology lead to a competitive advantage? A case study of Flanders using European patent data. *Scientometrics*, **44** (3), 379-400.

Full Text: [1999\Scientometrics44, 379.pdf](1999/Scientometrics44,%20379.pdf)

Abstract: The study tries to analyze regional technological capabilities, linking technological positions to economic strength of the region. To measure this link, we correlate the EPO patent data with trade data to assess the degree to which technological advantages are translated into comparative advantages for the Flemish region in Belgium. The analysis for Flanders provides some interesting insights. Following the skewed distribution of firms, the technological areas in which Flanders is able to build a strong position are very specific: printing technology, weaving technology, photography and recently also telecommunications. Weak positions are outspoken in car technology. Linking these strengths and weaknesses in technological areas to economic activity revealed an important mismatch between both. Most of the Flemish patents are in sectors without any comparative advantage, while most of the sectors where Flanders does hold a comparative advantage, like chemicals and pharmaceuticals, do not show strong technological advantages in terms of patents. Given the mismatch that was detected between technological positions and economic advantages, it is of crucial importance to better understand the (missing) links between the various actors in the regional innovation system. The analysis points out two important issues. The large and growing number of foreign applicants to Belgian/Flemish inventors and the large number of subsidiaries of foreign firms among Belgian/Flemish applicants illustrate the pervasiveness of the foreign dimension in the Belgian/Flemish technological landscape. Also very specific to the Belgian/Flemish situation, is the limited importance of universities or research centers in terms of patenting activities.

Keywords: Activity, Analysis, Belgium, Case Study, Chemicals, Complex, Distribution, Economic, Electronics, Importance, Indicators, Industry, Innovation, Landscape, Lead, Patents, Pharmaceuticals, Position, Regional, Research, Strength, Strengths, Telecommunications, Universities

? De Looze, M.A., Roy, A., Coronini, R., Reinert, M. and Jouve, O. (1999), Two measures for identifying the perception of risk associated with the introduction of transgenic plants. *Scientometrics*, **44** (3), 401-426.

Full Text: [1999\Scientometrics44, 401.pdf](1999/Scientometrics44,%20401.pdf)

Abstract: The interweaving of three different sorts of software based on different algorithms (co-word analysis and downward hierarchical classification) and applied on a file tin the field of risk assessment through the introduction of transgenic plants) extracted from the CAB (Commonwealth Agricultural Bureau) data base, has enable us to provide three types of results: Leximappe provides a synthetic image from clusters of key-words. The main themes were identified. Alceste improves a corpus’ characterization and allows a logical reading of it, thanks to the creation of categories, along with their mutual dependencies, the peculiar meaning of each and their division in time. Moreover, Alceste allows us to perceive the contexts of the contents previously identified under Leximappe. Sampler allows us to go into the derails of the terms association in graphical form and detail the specific orientations of the corpus, especially with the inscription of weak signals. Finally, this software, applied from the categories drawn from Alceste, offers for each category a meaningful graphic representation. We can argue that the different ways of measuring and presenting results are complementary since they highlight different aspects of risk assessment carried by different actors, as it is underlined in social science studies of public controversy. Moreover we can follow these actors through the categories and clusters (socioeconomic, scientific and risk assessment linked to regulation and policy) which are more and more differenciated in time. This methodology allows the study of emerging processes in the social construction of issues within controversies.

Keywords: Algorithms, Analysis, Assessment, Base, Characterization, Classification, Clusters, Co-Word Analysis, Creation, Meaning, Methodology, Perception, Plants, Policy, Regulation, Representation, Risk, Risk Assessment, Science, Science Studies, Social, Software, Synthetic, Tin

? Glänzel, W., Schubert, A. and Czerwon, H.J. (1999), An item-by-item subject classification of papers published in multidisciplinary and general journals using reference analysis. *Scientometrics*, **44** (3), 427-439.

Full Text: [1999\Scientometrics44, 427.pdf](1999/Scientometrics44,%20427.pdf)

Abstract: A serious shortcoming of bibliometric studies based on the (Social) Science(s) Citation Index is the lack of an universally applicable subject classification scheme as individual papers are concerned. Subject classification of papers on the basis of assigning journals to subject categories (like those found in the various supplements of ISI databases) works well in case of highly specialised journals, but fails for multidisciplinary journals such as Nature,Science and PNAS and so far as subfields are taken into consideration - also for ‘general’ journals (e.g. JACS or Angewandte Chemie). This study presents the results of a pilot project attempting to overcome this shortcoming by delimiting the subject of papers published in multidisciplinary and general journals by an item-by-item subject classification scheme, where assignment is based on the analysis of the subject classification of reference literature. The results clearly confirmed the conclusions of earlier studies by the authors in the field of reference analysis. For the really important journals (sufficiently high number of annual publications and high impact with respect to the field), the share of classifiable papers was surprisingly high, and the assignment proved reliable as well. Since papers in the leading general and multidisciplinary journals are frequently citing general and multidisciplinary journals, an iterated application of the procedure is expected to increase the number of classifiable publications. The results of the new methodology may improve the validity of bibliometric studies for research evaluation purposes.

Keywords: Analysis, Bibliometric, Bibliometric Studies, Classification, Databases, Evaluation, General, Impact, ISI, Methodology, Multidisciplinary, PNAS, Publications, Reference, Research, Research Evaluation, Science, Validity

? Gomez, I., Fernandez, M.T. and Sebastian, J. (1999), Analysis of the structure of international scientific cooperation networks through bibliometric indicators. *Scientometrics*, **44** (3), 441-457.

Full Text: [1999\Scientometrics44, 441.pdf](1999/Scientometrics44,%20441.pdf)

Abstract: International scientific cooperation of Latin American countries amongst themselves, with the USA and with the European Union in the period 1991-1995 was studied. The analysis deepens in the differences per subject area and the influence of the regional axis involved. Collaboration patterns differ according to the scientific size of the Latin American countries, the thematic areas and whether a bilateral collaboration or a participation in a multilateral network takes place. Some special characteristics of multi-regional cooperation networks are presented.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Bilateral, Characteristics, Collaboration, Countries, European Union, Indicators, Participation, Patterns, Regional, Size, Structure, USA

Lange, L.L. and Frensch, P.A. (1999), Gaining scientific recognition by position: Does editorship increase citation rates? *Scientometrics*, **44** (3), 459-486.

Full Text: [1999\Scientometrics44, 459.pdf](1999/Scientometrics44,%20459.pdf)

Abstract: We investigated three rival hypotheses concerning scientific communication and recognition: the performance hypothesis and two alternative assumptions, the reputation hypothesis and the resource hypothesis. The performance hypothesis reflects the norm of universalism in the sense given by Merton, the reputation hypothesis predicts a Matthew Effect (scientists receive communications and recognition on the basis of their reputation), and the resource hypothesis assumes that communication with other scientists is used as a form of asset to defend one’s own research results. Using bibliometric methods, we assessed whether assuming an important scientific position enhances scientific impact and prestige. Specifically, we explored whether a person’s assumption of editorship responsibilities of a psychology journal increases the frequency with which that person is cited in the Social Sciences Citation Index. The data base consisted of ten psychology journals, seven premier American and three German journals, covering the years 1981 to 1995. Citation rates for the years prior to, during, and following periods of editorship were compared for three groups: editors cited in the journal they edited, editors cited in a journal they did not edit, and non-editors. The results showed that during their editorship, editors showed an increased citation rate in the journal edited, this result was found for American journals, but not for German journals. These findings indicate that, for American journals, assuming editorship responsibilities for a major psychology journal increases one’s scientific impact, at least as reflected by a measure of citation rate. A careful examination of ages of the non-editors’ citations reveals that the post-editorship citation rates of editors and comparable non-editors do not differ significantly. The reputation hypothesis (Matthew Effect) is therefore preferred for interpreting the results, because it shows the cumulative nature of prestige-oriented citations. The results contradict the convention of using citation rates as pure performance measures.

Keywords: Alternative, Assumptions, Bibliometric, Bibliometric Methods, Citation, Citations, Communication, Communications, Cumulative, Data, Data Base, Examination, Impact, Journal, Journals, Measure, Methods, Performance, Person, Psychology, Rates, Research, Research Results, Responsibilities, Scientific Communication

? Nederhof, A.J. and Van Vijk, E. (1999), Profiling institutes: Identifying high research performance and social relevance in the social and behavioral sciences. *Scientometrics*, **44** (3), 487-506.

Full Text: [1999\Scientometrics44, 487.pdf](1999/Scientometrics44,%20487.pdf)

Abstract: This study focuses on the identification of high output research and high impact research in the social and behavioral sciences. A second objective is to monitor developments in research that is related to societal needs and problems. For each topic, we identify institutes and authors that have contributed a considerable number of SSCI articles and/or several (relatively) highly cited articles on a topic. To identify papers with a (relatively) high impact, the present study used two citation thresholds, each based upon a combination of a statistically determined minimum number of ‘external’ citations (by others than the authors of a paper), and a statistical comparison with world average citation levels. Topics were categorised according to social relevance. Detailed profiles of bath large and small institutes are obtained, showing strengths and weaknesses in research performance that lend to be obscured by standard indicators focusing on ‘average’ research performance. Socially relevant topics tend to be concentrated in multidisciplinary clusters, whereas clusters dominated by one or two disciplines contain more basic research. The results provide a first insight in the extent to which institutes and authors address socially relevant topics. Use of the results by policy bodies seems dependent upon which organisational level of research they tend to address.

Keywords: Basic Research, Behavioral, Bibliometric Indicators, Books, Citation, Citations, Clusters, Comparison, Countries, Identification, Impact, Indicators, Journals, Lend, Levels, Multidisciplinary, Output, Paper, Performance, Policy, Profiles, Research, Research Performance, Sciences, Social, Standard, Strengths, Thresholds

? Roosendaal, H.E. and Geurts, P.A.T.M. (1999), Scientific communication and its relevance to research policy. *Scientometrics*, **44** (3), 507-519.

Full Text: [1999\Scientometrics44, 507.pdf](1999/Scientometrics44,%20507.pdf)

Abstract: This paper addresses the relation between developments in scientific communication and research. The developments in scientific communication are related to developments brought about by opportunities provided by the development and wide-scale introduction of modern information and communication technology. However, this paper does not focus on technological developments, but rather discusses how these new developments in scientific communication enable developments in research and research policy, and vice versa. The role of scientometrics and bibliometrics in this context is briefly discussed.

Keywords: Bibliometrics, Communication, Development, Information, Information and Communication, Information and Communication Technology, Paper, Policy, Research, Role, Scientific Communication, Scientometrics, Vice

? Rousseau, R. (1999), Temporal differences in self-citation rates of scientific journals. *Scientometrics*, **44** (3), 521-531.

Full Text: [1999\Scientometrics44, 521.pdf](1999/Scientometrics44,%20521.pdf)

Abstract: Temporal differences in self-citing and self-cited rates of journals are studied. It is concluded that the citation curve of a journal is composed of two curves with different characteristics: a self citation (or self-cited) curve and a curve representing external citations.

Keywords: Characteristics, Citation, Citations, Indicators, Information-Science, Journal, Library

Rowlands, I. (1999), Patterns of author cogitation in information policy: Evidence of social, collaborative and cognitive structure. *Scientometrics*, **44** (3), 533-546.

Full Text: [1999\Scientometrics44, 533.pdf](1999/Scientometrics44,%20533.pdf)

Abstract: This paper presents the findings of an author cocitation study in the field of information policy. Cocitation frequencies for 21 leading authors over the period 1972-1997 were obtained from the multidisciplinary database Social Sciences Citation Index. The raw cocitation counts were transformed into a matrix of Pearson correlation profiles and subsequently visualised using multidimensional scaling techniques. An initial interpretation of the structure of the field of information policy was attempted, drawing on a range of non-bibliometric evidence. The results of a customised postal questionnaire to the data subjects themselves supports the present writer’s allocation of the authors into thematic clusters. These results suggest that the social, collaborative and intellectual structure of information policy scholarship are highly convergent.

Keywords: Allocation, Cocitation, Correlation, Data, Database, Evidence, Field, Information, Intellectual Structure, Matrix, Multidimensional, Multidimensional Scaling, Multidisciplinary, Policy, Profiles, Questionnaire, Scaling, Scholarship, Social, Structure, Techniques

? Schwechheimer, H. and Winterhager, M. (1999), Highly dynamic specialities in climate research. *Scientometrics*, **44** (3), 547-560.

Full Text: [1999\Scientometrics44, 547.pdf](1999/Scientometrics44,%20547.pdf)

Abstract: In this paper the identification and analysis of highly dynamic, rapidly developing research fronts of climate research are demonstrated. The underlying method based on co-citation analysis is described, and two selected highly dynamic specialities (HDS) are analysed using journal profiles, co-citation maps, and actor profiles as information elements. The two examples demonstrate how co-citation analysis can be used to identify and analyse highly dynamic specialities.

Keywords: Analysis, Atmosphere, Boundary-Layer, Circulation, Climate, Co-Citation, Co-Citation Analysis, Cocitation, Dynamic, Elements, HDS, Identification, Information, Journal, Model, Natural Variability, Paper, Profiles, Research, Sensitivity, Signals, System, Temperature

? Wouters, P. (1999), Beyond the holy grail: From citation theory to indicator theories. *Scientometrics*, **44** (3), 561-580.

Full Text: [1999\Scientometrics44, 561.pdf](1999/Scientometrics44,%20561.pdf)

Abstract: A recurring theme in the use of science and technology indicators, as well as in the construction of new ones, is the interpretation of these indicators. Given the dependence on citation data in the majority of interesting science and technology indicators, a general citation theory would make the meaning of S&T indicators more transparent. Hence the continuing call for a citation theory in scientometrics. So far, such a theory has not yet been accepted by the experts in the field. This paper suggests an explanation for this. It also tries to sketch the outline of a general indicator theory by discussing new implications of an earlier proposal (Wouters, 1998) in relation to existing citation and indicator theories.

Keywords: Citation, Dependence, General, Indicator, Indicators, Meaning, Paper, Science, Scientometrics, Theory, Transparent

? Molas-Gallart, J. (1999), Measuring defence R&D: A note on problems and shortcomings. *Scientometrics*, **45** (1), 3-16.

Full Text: [1999\Scientometrics45, 3.pdf](1999/Scientometrics45,%203.pdf)

Abstract: Defence R&D continues to account for a very substantial share of many countries’ research effort, often retaining or even increasing its role within the national innovation systems. Yet the quantitative analysis of defence research efforts and their impact is impaired by difficulties in defining defence R&D. The article studies these difficulties and focuses on the issue of identifying what constitutes, does not constitute, defence R&D. It finds that the OECD approach of defining defence R&D on the basis of the primary goals of the research is inadequate, particularly in the present context of the growing emphasis on dual-use technologies and research. It then analyses alternative approaches that could provide a more solid grounding for any systematic effort to collect international defence R&D data.

Keywords: Analysis, Defence, Impact, Innovation, Quantitative Analysis, Research, Role, Technologies

Lee, M., Om, K. and Koh, J. (1999), Blind review of research proposals in Korea: Its effectiveness and factors affecting applicant detection. *Scientometrics*, **45** (1), 17-31.

Full Text: [1999\Scientometrics45, 17.pdf](1999/Scientometrics45,%2017.pdf)

Abstract: This article addresses the potential effectiveness of blind review in selecting and funding research proposals in a ‘scientifically small’ country. By analyzing 474 responses of the blinded reviewers ever worked for Korea Science and Engineering Fund, it was found that blind review is fairly effective. About two thirds of the blinded reviewers were unable to recognize the applicants accurately The applicant detection was affected by (1) physical age, (2) professional experience, and (3) geographical location of doctoral education of the applicants, (4) review experience, (5) rank of employing universities of the reviewers, and (6) similarity of research interest between an applicant and a reviewer. It was also found that blind review was more strongly advocated by those who had made a wrong guess or who had given up guessing. Implications of the findings and future research directions were discussed.

Keywords: Age, Consensus, Education, Effective, Effectiveness, Funding, Korea, Location, Made, Peer, Physical, Rank, Research, Review, Similarity, Universities

? Huber, J.C. (1999), Inventive productivity and the statistics of exceedances. *Scientometrics*, **45** (1), 33-53.

Full Text: [1999\Scientometrics45, 33.pdf](1999/Scientometrics45,%2033.pdf)

Abstract: We show that inventive productivity can be described by two variables, Frequency and Lifetime. For several samples of inventors, we show that the Exponential and Generalized Pareto distributions provide excellent goodness-of-fit to these variables. Furthermore, good fits to these distributions arises naturally from the statistics of exceedances. Thus, a better theoretical foundation and connection to environmental variables is shown for Frequency and Lifetime than has been shown for Lotka’s Law.

Keywords: Creativity, Cumulative Advantage, Distributions, Environmental, Environmental Variables, Generalized Pareto Distribution, Goodness, Model, Of-Fit Tests, Participation, Precision, Productivity, Publication, Scientific Productivity, Statistics

? Coronini, R. and Mangematin, V. (1999), From individual scientific visibility to collective competencies: The example of an academic department in the social sciences. *Scientometrics*, **45** (1), 55-80.

Full Text: [1999\Scientometrics45, 55.pdf](1999/Scientometrics45,%2055.pdf)

Abstract: The article discusses the role of university departments in the social sciences. It studies how to describe the three missions of university departments: education, research and consultancy services for public and private organisations. It also proposes some tools to evaluate to what extent these missions are connected. Until now, evaluation in this domain has focused primarily on research activities and far too few indicators have been developed for the other two missions. Moreover, evaluation is often performed on an individual basis, so that the synergy generated by work collectives is rarely evaluated. The purpose of this article is to propose a method for identifying and describing the competencies of a social science research and teaching department. This method can be used to study the articulation between the department’s different activities - research, expertise and teaching. Maps of activity are generated, which can serve as a basis for strategic planning of future trends. The approach is based on an analysis of ‘traces’ (articles, contracts, research reports, postgraduate training modules) of the activity of the different components of the Social Science Department, using lexicographic analysis tools. With keywords, titles, summaries and synopses of lectures, it is possible to draw up ‘maps’ representing the department’s main competencies.

Keywords: Academic, Activity, Analysis, Core, Economics, Education, Evaluation, Indicators, Planning, Profile, Research, Role, Science, Science Research, Sciences, Social, Social Sciences, Strategic Planning, Teaching, Tools, Training, Trends, Visibility

Ojasoo, T. and Doré, J.C. (1999), Citation bias in medical journals. *Scientometrics*, **45** (1), 81-94.

Full Text: [1999\Scientometrics45, 81.pdf](1999/Scientometrics45,%2081.pdf)

Abstract: Multivariate statistical analysis of the citation profiles of urology and related journals (i.e. the relative extent to which each journal cites itself and other journals within a set) has highlighted hidden correlations. We reveal the existence of a ‘transatlantic’ rift in citation practice and of a confined discipline-oriented world which interfaces weakly with many other disciplines. We also interpret the results of our analyses in terms of basic and clinical research and examine whether there is a time-related selectivity in citation. Taken together, our results call for a serious appraisal of present-day research trends and of their evaluation. The open question is how to create a terrain that will foster original, possibly interdisciplinary, research in developed nations whilst maintaining cultural individuality.

Keywords: Analysis, Bias, Citation, Clinical, Correlations, Evaluation, Interdisciplinary, Interfaces, Journal, Medical, Medical Journals, Practice, Profiles, Publication, Research, Research Trends, Selectivity, Statistical Analysis, Trends, Urology

Pereira, J.C.R. and Escuder, M.M.L. (1999), The scenario of Brazilian health sciences in the period of 1981 to 1995. *Scientometrics*, **45** (1), 95-105.

Full Text: [1999\Scientometrics45, 95.pdf](1999/Scientometrics45,%2095.pdf)

Abstract: Ensuing a previous study of Brazilian sciences production for the period 1981-95, health sciences were taken apart for scrutiny. ISI data was obtained in an aggregate format comprising 40 health research fields recording their yearly number of papers, proportion out of the country, proportion out of the field, and impact relative to field.

Simple linear regression was used to examine time trends in production and impact of research fields. A complementary variable representing growth trend was computed as the regression slope. Data were then analysed by means of Factor and Correspondence Analysis. Results allowed the production of location maps of research fields so that hierarchy and relationships among them could be examined in the form of geometric distances.

It was found that health sciences represent 42% of the Brazilian scientific production and that their trends in both production and impact do not differ from other sciences taken altogether. Measurements of production were found negatively correlated with impact and factor analysis revealed that the major distinction between fields is attributable to production (64% of measurement variations against 19% due to impact). Experimental Biology & Medicine largely exceeds other fields in production, though at ordinary levels of impact. Correspondence analysis refined the study of impact allowing the identification of the best performers as Clinical Immunology & Infectious Diseases, Environmental & Social Medicine, and Radiology & Nuclear Medicine.

The information provided can advise national policy makers on science & technology about priorities concerning the improvement of the country’s competitiveness.

Keywords: Aggregate, Analysis, Factor Analysis, Growth, Health, Health Sciences, Identification, Impact, Information, ISI, Levels, Linear, Linear Regression, Location, Measurement, Policy, Production, Profile, Regression, Research, Science, Sciences, Scientific Production, Time Trends, Trend, Trends

Karki, M.M.S. and Garg, K.C. (1999), Scientometrics of Indian organic chemistry research. *Scientometrics*, **45** (1), 107-116.

Full Text: [1999\Scientometrics45, 107.pdf](1999/Scientometrics45,%20107.pdf)

Abstract: Making use of scientometric techniques, the paper attempts to assess the performance of Indian organic chemistry research during the 70s and 80s. Identifies the significant work and its impact using mainstream connectivity, surrogate measures of quality and relative impact indicators. It is observed that the organic chemistry research performed in India during the later period (80s) has improved slightly as compared to the previous period (70s).

Keywords: Basic Research, Bibliometrics, Connectivity, Impact, India, Indicators, Organic, Organic Chemistry, Paper, Performance, Quality, Research, Research Performance, Techniques

Phelan, T.J. (1999), A compendium of issues for citation analysis. *Scientometrics*, **45** (1), 117-136.

Full Text: [1999\Scientometrics45, 117.pdf](1999/Scientometrics45,%20117.pdf)

Abstract: This paper examines a number of the criticisms that citation analysis has been subjected to over the years. It is argued that many of these criticisms have been based on only limited examinations of data in particular contexts and it remains unclear how broadly applicable these problems are to research conducted at different levels of analysis, in specific fields, and among various national data sets. Relevant evidence is provided from analysis of Australian and international data. Citation analysis is likely to be most reliable when data is aggregated and at the highly-cited end of the distribution. It is possible to make valid inferences about individual cases, although considerable caution should be used. Bibliometric measures should be viewed as a useful supplement to other research evaluation measures rather than as a replacement.

Keywords: Analysis, Basic Research, Citation, Citation Analysis, Distribution, Evaluation, Indicators, Levels, Paper, Replacement, Research, Research Evaluation, Science

? Kozlowski, J., Radosevic, S. and Ircha, D. (1999), History matters: The inherited disciplinary structure of the post-communist science in countries of Central and Eastern Europe and its restructuring. *Scientometrics*, **45** (1), 137-166.

Full Text: [1999\Scientometrics45, 137.pdf](1999/Scientometrics45,%20137.pdf)

Abstract: The inherited disciplinary structure of the science of post-communist countries of CEE carries a strong common features of its past. The communist heritage is present in: a) a relatively homogeneous research profile among post-communist countries, b) the similar structure of disciplinary comparative advantages of post-communist countries, c) the unbalanced and concentrated disciplinary structure of comparative advantages. The analysis is based on ISI databases and uses statistics on papers and citations for the 1992-1997 period for all central and eastern European countries as well as for other world regions. In the conclusions we discuss the relevance of the results for the restructuring of science in the countries of Central and Eastern Europe.

Keywords: Analysis, Citations, Databases, Eastern Europe, Europe, Features, Homogeneous, ISI, Profile, Research, Science, Statistics, Structure

? Eto, H. (1999), The interest of scientific communities in sea-related research topics. *Scientometrics*, **45** (2), 167-183.

Full Text: [1999\Scientometrics45, 167.pdf](1999/Scientometrics45,%20167.pdf)

Abstract: Articles on sea-related topics such as ocean, fishery, crimes at sea, law of the sea, distress at sea and others were counted for journals in the fields supposedly comprising sea-related specialties such as policy/political science, law and its enforcement, agriculture, transportation, and operational research. The number of such articles was found very few in all the surveyed journals. The follow-up search was made for other journals of the same specialties, obtaining the same result. Further, the same result was found to hold for other issues of the journals published in different years: That is, this phenomenon was found stable for years. Its reasons were discussed, and some interpretation and their policy implications were presented.

Keywords: 1990s, Agriculture, Authorship Patterns, Collaboration, Communities, Distress, Enforcement, Fishery, Follow up, Follow-up, Journals, Law, Made, Policy, Policy Implications, Quantitative Criminology, Research, Science, Transportation

Glänzel, W., Schubert, A. and Czerwon, H.J. (1999), A bibliometric analysis of international scientific cooperation of the European Union (1985-1995). *Scientometrics*, **45** (2), 185-202.

Full Text: [1999\Scientometrics45, 185.pdf](1999/Scientometrics45,%20185.pdf)

Abstract: Scientific cooperation of the EU countries with other developed regions, with Economies in Transition and with Developing Countries is analysed as it is reflected in the bibliometric indicators of internationally co-authored publications. The citation attractivity of these publications shows that international scientific collaboration is particularly advantageous for less advanced countries, but also highly industrialised countries benefit from it.

Keywords: Analysis, Benefit, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Citation, Collaboration, Countries, EU, European Union, Indicators, Publications, Sciences, Scientific Collaboration, Subfields

? Rey-Rocha, J. and Martin-Sempere, M. (1999), The role of domestic journals in geographically-oriented disciplines: The case of Spanish journals on earth sciences. *Scientometrics*, **45** (2), 203-216.

Full Text: [1999\Scientometrics45, 203.pdf](1999/Scientometrics45,%20203.pdf)

Abstract: The role of domestic journals in disseminating research results in the field of Earth Sciences in Spain is discussed. The analysis is based on bibliometric indicators of Spanish scientific production, as well as on the opinion of Spanish researchers in this field, obtained through a specially designed survey. A reasonable correspondence has been found between the results of bibliometric analysis and scientists’ judgements. Results show that 69% of Spanish articles in Earth Sciences were published in Spanish journals during the period 1990-1994. Scientists use both national and international journals to communicate their research results, although due to the nature of the discipline, geographically oriented and therefore mostly devoted to local problems, they use basically domestic journals. In terms of international visibility, although none of the Spanish journals in this field is covered by the SCI, most of them are covered by some of the most representative international databases in the field concerned. The study points out the importance of domestic journals in the field of Earth Sciences in Spain.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Databases, Earth, Importance, Indicators, Local, Production, Research, Research Results, Role, SCI, Sciences, Scientific Literature, Scientific Production, Spain, Survey, Visibility

Egghe, L., Rousseau, R. and Yitzhaki, M. (1999), The ‘own-language preference’: Measures of relative language self-citation. *Scientometrics*, **45** (2), 217-232.

Full Text: [1999\Scientometrics45, 217.pdf](1999/Scientometrics45,%20217.pdf)

Abstract: It has already been pointed out that the foreign language barrier is probably the greatest impediment to the free flow and transfer of information. This barrier is even growing as scientists of more and more countries publish in their own languages. Almost all studies addressing the language barrier problem were conducted from an Anglo-Saxon perspective, limiting their scope to English-language sources or English speakers. Little research has been devoted to studying and measuring language preference among non-English-speaking scholars.

This article reviews measures proposed in former studies such as the ‘relative own-language preference’ indicator, and the ‘straight odds ratio’, pointing out their advantages and drawbacks. Two new refined measures (in both ‘raw’ and normalised versions) are offered, claiming to be free of these drawbacks, and thus enabling a better and more reliable comparison between journals of different languages. Practical use of the proposed measures is illustrated by applying them to findings of a former language-citation study done on nine sociology journals.

Keywords: Barrier, Comparison, Flow, Indicator, Information, Language, Languages, Preference, Research, Reviews, Sources, Transfer

Kademani, B.S., Kalyane, V.L. and Jange, S. (1999), Scientometric portrait of Nobel laureate Dorothy Crowfoot Hodgkin. *Scientometrics*, **45** (2), 233-250.

Full Text: [1999\Scientometrics45, 233.pdf](1999/Scientometrics45,%20233.pdf)

Abstract: Dorothy Crowfoot Hodgkin (1910-1994), the renowned crystallographer and the Nobel prize winner in Chemistry (1964) was responsible for developing the X-ray diffraction method of finding the exact structure of large and complicated molecules, such as Penicillin, Vitamin B-12, Insulin, etc. Her 180 publications during 1932-1988 were analyzed by domains, authorship pattern, publication productivity, scattering of publications and the keywords used in the titles of her papers.

Keywords: Authorship, Complicated, Productivity, Publication, Publications, Structure, X-Ray Diffraction

Garg, K.C. and Padhi, P. (1999), Scientometrics of laser research literature as viewed through the journal of current laser abstracts. *Scientometrics*, **45** (2), 251-268.

Full Text: [1999\Scientometrics45, 251.pdf](1999/Scientometrics45,%20251.pdf)

Abstract: An analysis of 4650 publications abstracted in Journal of Current Laser Abstracts Vol. 27 (April 1990-March 1991) indicates that 14 countries contributed about 94% of the research output with USA toping the list followed by Japan and the erstwhile USSR, Technical reports and patents, besides articles in scientific journals constitute an important source of information on laser science and technology. ‘Spectroscopy of laser output’ is the sub-speciality which has received maximum emphasis. USA has paid almost equal emphasis for theoretical, experimental and applications of laser research, while such pattern is not applicable for other countries. For USSR, China, and India, the impact of research did not commensurate with the publication effort.

Keywords: Analysis, Applications, Areas, China, Current, Datafiles, Experimental, Fields, Impact, India, Indicators, Information, Japan, Journal, Output, Patents, Physics, Publication, Publications, Research, Science, Source, Subfields, USA, USSR, World Science

Gupta, B.M., Kumar, S. and Aggarwal, B.S. (1999), A comparision of productivity of male and female scientists of CSIR. *Scientometrics*, **45** (2), 269-289.

Full Text: [1999\Scientometrics45, 269.pdf](1999/Scientometrics45,%20269.pdf)

Abstract: The paper examines the scientific productivity of male and female scientists working in the Council of Scientific and Industrial Research (CSIR), India at the overall agency level and at the group of laboratories level, characterized by three broad subjects of physical, biological, and engineering sciences. The productivity of scientists is evaluated on the basis of three parameters: the extent of scientists not publishing any paper, the average number of papers per scientist, and using Lotka’s approach. In order to find out whether there is any significant difference between male and female productivity distributions, a Chi-square test is used. Studies the applicability of Lotka’s inverse power law and some other statistical models in the distribution of scientific productivity of male and female scientists. Concludes that no significant difference exists between productivity distributions of male and female scientists.

Keywords: Chi-Square, Chi-Square Test, Distribution, Distributions, Duration, Engineering, Female, Frequency-Distribution, Group, India, Law, Lotka Law, Male, Models, Order, Paper, Parameters, Participation, Physical, Productivity, Publication, Publishing, Sciences, Scientific Productivity, Speed, Test

? Egghe, L. (1999), An explanation of the relation between the fraction of multinational publications and the fractional score of a country. *Scientometrics*, **45** (2), 291-310.

Full Text: [1999\Scientometrics45, 291.pdf](1999/Scientometrics45,%20291.pdf)

Abstract: Consider a country’s national output, measured by counting the number of authors from country c that collaborate in every paper in a bibliography. Depending on whether country c appears at least once in every paper, we are able to deduce the corresponding relationship between c’s fractional score and its fraction of multinational papers to which c belongs. One of these models, a slowly decreasing concave function is similar to the relation observed by Nederhof and Moed(1) between the fractionated score of a country c and its fraction of multinational papers. The proof of the models developed here uses a stochastic property of weighting schemes, namely that the average fractional score of a country equals its total score.

Keywords: Fraction, Function, Models, Output, Paper, Publications, Stochastic, Weighting

? Eto, H. (1999), Relationship of mathematical programming with mathematics, economic regional planning and other specialties. *Scientometrics*, **45** (2), 311-324.

Full Text: [1999\Scientometrics45, 311.pdf](1999/Scientometrics45,%20311.pdf)

Abstract: The references cited by papers in the four volumes of international journal titled Mathematical Programming (Math. Frog.) published in 1997 were surveyed. The most frequently cited journal was found to be Math. Frog. itself. Generally, the cited references were found to be heavily concentrated on particular journals or books by particular publishers specialised in particular specialties. Despite the historical background having originated from mathematics and economics and having developed together with the development of business administration, works in these specialties were found to be rarely cited. The research field of mathematical programming was hereby judged to have formed its own closed specialty, having rather isolated itself from others in a self-sufficient way. Its shift from economic, regional or business planning to the experiment design or the engineering design was observed.

Keywords: Administration, Background, Business Administration, Design, Development, Economic, Economics, Engineering, Experiment, Field, Historical, Journal, Management, Planning, Programming, Regional, Regional Planning, Research

Jin, B.H. and Wang, B. (1999), Chinese science citation database: Its construction and application. *Scientometrics*, **45** (2), 325-332.

Full Text: [1999\Scientometrics45, 325.pdf](1999/Scientometrics45,%20325.pdf)

Abstract: The important role of the Institute for Scientific Information’s Science Citation Index (SCI) as an international retrieval and evaluation tool is briefly discussed. The role of Chinese Science Citation Database (CSCD), the counterpart of SCI in China, in improving the application of citation retrieval method in China, is summarized. The construction process and status quo of CSCD are explained.

Keywords: China, Chinese, Citation, Evaluation, Process, Role, SCI, Science, Science Citation Index

? Bundschuh, E. (1999), Science and the academic system in transition - An International Expert Meeting on Evaluation - 3-5 July, 1998 - Vienna, Austria - Welcoming and opening remarks. *Scientometrics*, **45** (3), 335-336.

Full Text: [1999\Scientometrics45, 335.pdf](1999/Scientometrics45,%20335.pdf)

Keywords: Academic

? Escritt, R. (1999), Welcoming and opening remarks: Science and the academic system in transition - The role of evaluation. *Scientometrics*, **45** (3), 337.

Full Text: [1999\Scientometrics45, 337.pdf](1999/Scientometrics45,%20337.pdf)

Keywords: Academic, Evaluation, Role

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Full Text: [1999\Scientometrics45, 339.pdf](1999/Scientometrics45,%20339.pdf)

Keywords: Academic

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Full Text: [1999\Scientometrics45, 343.pdf](1999/Scientometrics45,%20343.pdf)

Keywords: Academic

? Davignon, E. (1999), Evaluation in management and policy making at European level. *Scientometrics*, **45** (3), 347-354

Full Text: [1999\Scientometrics45, 347.pdf](1999/Scientometrics45,%20347.pdf)

Keywords: Management, Policy, Policy Making, Policy-Making

? Kneucker, R.F. (1999), Evaluation in management and policy making at European level. *Scientometrics*, **45** (3), 355-357

Full Text: [1999\Scientometrics45, 355.pdf](1999/Scientometrics45,%20355.pdf)

Keywords: Management, Policy, Policy Making, Policy-Making

Bundschuh, E. (1999), Quality assessment and structural change in universities. *Scientometrics*, **45** (3), 359-365.

Full Text: [1999\Scientometrics45, 359.pdf](1999/Scientometrics45,%20359.pdf)

Keywords: Assessment, Universities

Lindqvist, O.V. (1999), Quality assessment and structural change in universities. *Scientometrics*, **45** (3), 367-370.

Full Text: [1999\Scientometrics45, 367.pdf](1999/Scientometrics45,%20367.pdf)

Keywords: Assessment, Universities

Nybom, T. (1999), Quality assessment and structural change in universities. *Scientometrics*, **45** (3), 371-377.

Full Text: [1999\Scientometrics45, 371.pdf](1999/Scientometrics45,%20371.pdf)

Keywords: Assessment, Universities

Pompidou, A. (1999), Quality assessment and structural change in universities. *Scientometrics*, **45** (3), 379-379.

Full Text: [1999\Scientometrics45, 379.pdf](1999/Scientometrics45,%20379.pdf)

Keywords: Assessment, Universities

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Full Text: [1999\Scientometrics45, 381.pdf](1999/Scientometrics45,%20381.pdf)

Keywords: Evaluation, Role

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Full Text: [1999\Scientometrics45, 387.pdf](1999/Scientometrics45,%20387.pdf)

Keywords: Evaluation, Role

Papon, P. (1999), The role of national agencies in evaluation. *Scientometrics*, **45** (3), 391-399.

Full Text: [1999\Scientometrics45, 391.pdf](1999/Scientometrics45,%20391.pdf)

Keywords: Evaluation, Role

Seidel, H. (1999), The role of national agencies in evaluation. *Scientometrics*, **45** (3), 401-403.

Full Text: [1999\Scientometrics45, 401.pdf](1999/Scientometrics45,%20401.pdf)

Keywords: Evaluation, Role

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Full Text: [1999\Scientometrics45, 405.pdf](1999/Scientometrics45,%20405.pdf)

Keywords: Decision Making, Decision-Making, Evaluation, Interactions

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Full Text: [1999\Scientometrics45, 409.pdf](1999/Scientometrics45,%20409.pdf)

Keywords: Decision Making, Decision-Making, Evaluation, Interactions

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Full Text: [1999\Scientometrics45, 413.pdf](1999/Scientometrics45,%20413.pdf)

Van Raan, A. (1999), Advanced bibliometric methods for the evaluation of universities. *Scientometrics*, **45** (3), 417-423.

Full Text: [1999\Scientometrics45, 417.pdf](1999/Scientometrics45,%20417.pdf)

Keywords: Bibliometric, Bibliometric Methods, Evaluation, Methods, Universities

Braun, T. (1999), Bibliometric indicators for the evaluation of universities - Intelligence from the quantitation of the scientific literature. *Scientometrics*, **45** (3), 425-432.

Full Text: [1999\Scientometrics45, 425.pdf](1999/Scientometrics45,%20425.pdf)

Keywords: Evaluation, Indicators, Quantitation, Universities

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Full Text: [1999\Scientometrics45, 433.pdf](1999/Scientometrics45,%20433.pdf)

Sirilli, G. (1999), Innovation indicators in science and technology evaluation. *Scientometrics*, **45** (3), 439-443.

Full Text: [1999\Scientometrics45, 439.pdf](1999/Scientometrics45,%20439.pdf)

Keywords: Evaluation, Indicators, Science

Westerheijden, D.F. (1999), Innovation indicators in science and technology evaluation: Comments from a higher education point of view. *Scientometrics*, **45** (3), 445-453.

Full Text: [1999\Scientometrics45, 445.pdf](1999/Scientometrics45,%20445.pdf)

Keywords: Education, Evaluation, Higher Education, Indicators, Science

Airaghi, A. (1999), Quantitative methods in industrial research and development. *Scientometrics*, **45** (3), 455-457.

Full Text: [1999\Scientometrics45, 455.pdf](1999/Scientometrics45,%20455.pdf)

Keywords: Development, Industrial, Methods, Research, Research and Development

Veltkamp, E. (1999), Quantitative methods in industrial R&D. *Scientometrics*, **45** (3), 459-462.

Full Text: [1999\Scientometrics45, 459.pdf](1999/Scientometrics45,%20459.pdf)

Keywords: Industrial, Methods

Farge, Y. (1999), Quantitative methods in industrial research and development. *Scientometrics*, **45** (3), 463-465.

Full Text: [1999\Scientometrics45, 463.pdf](1999/Scientometrics45,%20463.pdf)

Keywords: Development, Industrial, Methods, Research, Research and Development

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Full Text: [1999\Scientometrics45, 467.pdf](1999/Scientometrics45,%20467.pdf)

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Full Text: [1999\Scientometrics45, 473.pdf](1999/Scientometrics45,%20473.pdf)

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Full Text: [1999\Scientometrics45, 475.pdf](1999/Scientometrics45,%20475.pdf)

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Full Text: [1999\Scientometrics45, 479.pdf](1999/Scientometrics45,%20479.pdf)

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Full Text: [1999\Scientometrics45, 485.pdf](1999/Scientometrics45,%20485.pdf)

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Full Text: [1999\Scientometrics45, 487.pdf](1999/Scientometrics45,%20487.pdf)

Strömholm, S. (1999), Peer review: Experience at National and European level. *Scientometrics*, **45** (3), 491-495.

Full Text: [1999\Scientometrics45, 491.pdf](1999/Scientometrics45,%20491.pdf)

Keywords: Review

Rojo, J.M. (1999), Peer review: Experiences at National and European level. *Scientometrics*, **45** (3), 497-500.

Full Text: [1999\Scientometrics45, 497.pdf](1999/Scientometrics45,%20497.pdf)

Keywords: Review

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Full Text: [1999\Scientometrics45, 501.pdf](1999/Scientometrics45,%20501.pdf)

Keywords: Evaluation, Measurement, Output, Programme Evaluation, Science

? Ledoux, M.J. (1999), Measuring the impact of the EU framework programme. *Scientometrics*, **45** (3), 505-506.

Full Text: [1999\Scientometrics45, 505.pdf](1999/Scientometrics45,%20505.pdf)

Keywords: EU, Impact

? Fayl, G. (1999), Measuring the impact of EU framework programme at national level. *Scientometrics*, **45** (3), 507.

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Keywords: EU, Impact

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Full Text: [1999\Scientometrics45, 509.pdf](1999/Scientometrics45,%20509.pdf)

Keywords: Regional, Structural Funds

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Full Text: [1999\Scientometrics45, 517.pdf](1999/Scientometrics45,%20517.pdf)

Keywords: Science, Structural Funds

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Full Text: [1999\Scientometrics45, 523.pdf](1999/Scientometrics45,%20523.pdf)

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Full Text: [1999\Scientometrics45, 531.pdf](1999/Scientometrics45,%20531.pdf)

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Full Text: [1999\Scientometrics45, 533.pdf](1999/Scientometrics45,%20533.pdf)

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Keywords: Information, Innovation

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Full Text: [1999\Scientometrics45, 547.pdf](1999/Scientometrics45,%20547.pdf)

Keywords: Information, Innovation

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Full Text: [1999\Scientometrics45, 551.pdf](1999/Scientometrics45,%20551.pdf)

Keywords: Information, Innovation

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Full Text: [1999\Scientometrics45, 557.pdf](1999/Scientometrics45,%20557.pdf)

Keywords: Information, Innovation

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Full Text: [1999\Scientometrics45, 561.pdf](1999/Scientometrics45,%20561.pdf)

Keywords: Global, Landscape

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Full Text: [1999\Scientometrics45, 565.pdf](1999/Scientometrics45,%20565.pdf)

Keywords: Information, Innovation

? Bundschuh, E. (1999), Closing remarks. *Scientometrics*, **45** (3), 567.

Full Text: [1999\Scientometrics45, 557.pdf](1999/Scientometrics45,%20557.pdf)

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Full Text: [1999\Scientometrics46, 5.pdf](1999/Scientometrics46,%205.pdf)

Keywords: Mexico

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Full Text: [1999\Scientometrics46, 11.pdf](1999/Scientometrics46,%2011.pdf)

Abstract: According to a quantitative analysis of the publications of the Black African Countries indexed in the SCI between 1992 to 1998, Nigeria seems to be the leader in scientific production on the black continent during that period (the term ‘Black Africa’ refers to all African countries excluding South Africa, Maghrebi, and Egypt). However, an analysis that only takes into account the number of publications does not necessarily disclose very much about neither the dynamics of the respective scientific community nor about the representativity of the country’s production with respect to its total population. Therefore, the number of publications per country is compared with the respective total population. According to this method, Kenya turns out to be the leader in scientific-publication production and several other countries get higher ranks. Additionally, any evaluation of scientific production in that part of the world should also take into account the specific features of these countries, e.g. the difficulties in publication and the existence of a large number of unpublished texts.

Keywords: Africa, Analysis, Citation, Community, Dynamics, Egypt, Evaluation, Features, Index, Kenya, Nigeria, Population, Production, Publication, Publications, Quantitative Analysis, SCI, Science, Science Citation Index, Scientific Production, South Africa

Garg, K.C. and Padhi, P. (1999), Scientometrics of institutional productivity of laser science and technology. *Scientometrics*, **46** (1), 19-38.

Full Text: [1999\Scientometrics46, 19.pdf](1999/Scientometrics46,%2019.pdf)

Abstract: An analysis of 4650 publications abstracted in Journal of Current Laser Abstracts (JCLA) during April 1990 - March 1991 indicates that 50 institutions located in 14 countries contributed about 39% of the S&T output. Twenty two of these institutions were from the USA, four each from Japan and the former USSR. Academic and research institutions were mainly concentrating their research efforts either in theoretical or experimental laser research. However, the industrial houses pursued their research in applications of the lasers. Most of these institutions published their output in scientific journals, but a few institutions had large amounts of technical reports and patents to their credit. Most of the institutions resembled in their activity and attractivity profiles. The values of normalized impact per paper, publication effectivity index and proportion of high quality papers for 12 institutions were less than average.

Keywords: Activity, Analysis, Applications, Experimental, Impact, Index, Indicators, Industrial, Institutions, Japan, Output, Paper, Patents, Productivity, Profiles, Publication, Publications, Quality, Research, Science, USA, USSR

de Marchi, M. and Rocchi, M. (1999), Summing up approaches to the study of science and technology indicators. *Scientometrics*, **46** (1), 39-49.

Full Text: [1999\Scientometrics46, 39.pdf](1999/Scientometrics46,%2039.pdf)

Abstract: Attempts to reduce the multiplicity and variety of the range of indicators presently used to measure science and technology to lean patterns have so far proved unsuccessful.

The reason for this is the ongoing lack of an all-comprehensive theory to rationalise every aspect of intricate and as yet obscure processes such as scientific discovery and technological innovation. We ought to expect from a theory of scientific and technological progress satisfactory not only in abstract terms but also as an empirical analysis is a composition of two aspects - static and dynamic - in a few homogeneous variables.

Keywords: Analysis, Bibliometric Analysis, Citations, Composition, Dynamic, Homogeneous, Impact, Indicators, Industrial-Innovation, Innovation, Patents, Range, Research Performance, Science, Static, Technological Innovation, Theory

Arkhipov, D.B. (1999), Scientometric analysis of *Nature*, the journal. *Scientometrics*, **46** (1), 51-72.

Full Text: [1999\Scientometrics46, 51.pdf](1999/Scientometrics46,%2051.pdf)

Abstract: 300,000 reports in Nature during the 1869-1998 period have been reviewed. The distribution of articles by subfields was determined. Additional sources of information were several journals on analytical chemistry and papers at the Pittsburg conference series during 1950-1999. The methodology used is based on the analysis of the average age of employed instruments. The agreement between scientometric data from various sources of information depends on the development stage of the field of science. Calculated and measured scientometric curves were compared. One of the key trends in the development of basic sciences, namely, the increase of articles dealing with instrumental analytical chemistry, in Nature is revealed.

Keywords: Age, Analysis, Analytical Chemistry, Development, Distribution, Evolution, Indicators, Information, Journal, Key, Methodology, Physics, Science, Sciences, Sources, Sources of Information, Trends

? Hayashi, T. and Fujigaki, Y. (1999), Differences in knowledge production between disciplines based on analysis of paper styles and citation patterns. *Scientometrics*, **46** (1), 73-86.

Full Text: [1999\Scientometrics46, 73.pdf](1999/Scientometrics46,%2073.pdf)

Abstract: To identify the differences in the knowledge production between disciplines, we analyzed the. relation between the average paper length and impact factor of 100 journals from 5 disciplines. We found negative correlation between the average length and the impact factor in the natural sciences, but not in the social sciences. We also analyzed the structures of paper and the citation patterns. These analyses are expanded to the comparison between Mode 1 and Mode 2. All results showed the natural sciences articles could emphasize the differences from previous studies and be diffused effectively by the short standardized style of paper.

Keywords: Analysis, Citation, Comparison, Correlation, Impact, Impact Factor, Knowledge, Natural, Paper, Production, Research Performance, Sciences, Social, Social Sciences

Andersen, H. (1999), Political attitudes and cognitive convictions among Danish social science researchers. *Scientometrics*, **46** (1), 87-108.

Full Text: [1999\Scientometrics46, 87.pdf](1999/Scientometrics46,%2087.pdf)

Abstract: Interview data from a survey among Danish researchers, mainly from social sciences (all disciplines, about on third of all) are used to examine connections between researcher political attitudes and their disciplinary cognitive paradigms. Included are researchers’ convictions concerning world view hypotheses, their basic assumptions regarding the subject matter in their fields of study, e.g., individuals, social action, and society as a whole, and their epistemic ideals and goals. Political attitude is indicated by researchers’ voting in the 1994 general election of the Danish Parliament. The results show big differences between social science disciplines regarding voting pattern. The analysis also clearly demonstrates connections between disciplinary cognitive convictions and political attitudes. The connections are interpreted as expressions of hermeneutic, historical links between political discourse formations and disciplinary paradigms.

Keywords: Analysis, Attitude, Attitudes, General, Historical, Matter, Science, Sciences, Social, Social Sciences, Survey

? Nagpaul, P.S. (1999), Transnational linkages of Indian science: A structural analysis. *Scientometrics*, **46** (1), 109-140.

Full Text: [1999\Scientometrics46, 109.pdf](1999/Scientometrics46,%20109.pdf)

Abstract: This study analyzes the pattern of transnational linkages of Indian science in eleven scientific fields (Mathematics, Physics, Chemistry, Biology, Earth & Space Science, Agriculture, Clinical Medicine, Biomedical Research, Engineering & Technology, Computer Science, and Materials Science) during the five-year period: 1990-1994. The following indicators are constructed to examine inter-field and inter-country differences in India’s transnational linkages: Internationalization index, Cooperation index, Cooperation extensiveness index and Affinity index. A four-category typology is proposed to classify the fields according to their propensities for attracting bilateral and multilateral cooperation with foreign countries. The structure of multidimensional system of relationships between India’s thirty-five most significant partner countries and eleven scientific fields is analyzed through correspondence analysis. A series of correspondence analyses are carried out on subsets of the multidimensional data to reveal the fine-grained structure of India’s cooperation links in clusters of specific fields and with clusters of specific countries.

Keywords: Analysis, Bilateral, Clusters, Index, Indicators, International Scientific Collaboration, Science, Structural Analysis, Structure, Typology

Souza, G.D., Alves, E. and Ávila, A.F.D. (1999), Technical efficiency of production in agricultural research. *Scientometrics*, **46** (1), 141-160.

Full Text: [1999\Scientometrics46, 141.pdf](1999/Scientometrics46,%20141.pdf)

Abstract: We define and model research production at Embrapa, the major Brazilian institution responsible for applied agricultural research. The main theoretical framework used is Data Envelopment Analysis - DEA. The economic interpretation of these models is explored to assess scale, congestion and cost efficiencies. Efficiency results are used to test for differences among types of research units and for the scale of operation. A further analysis of agricultural research in Brazil is carried out with the inclusion of three research centers in Argentina. Finally, DEA estimates are compared with the fit of a stochastic frontier.

Keywords: Agricultural, Analysis, Argentina, Brazil, Cost, Data Envelopment Analysis, Economic, Efficiency, Inclusion, Model, Models, Operation, Production, Research, Scale, Stochastic, Test

Melin, G. (1999), Impact of national size on research collaboration: A comparison between Northern European and American universities. *Scientometrics*, **46** (1), 161-170.

Full Text: [1999\Scientometrics46, 161.pdf](1999/Scientometrics46,%20161.pdf)

Abstract: It is generally assumed that there is a negative correlation between national scientific size and amount of international research collaboration: The larger the size is of the national scientific arena, the lesser the amount of international research collaboration. In this study, the collaboration pattern of 49 universities is analysed and a comparison is made between the Northern European and American universities in our sample. It was found that the American universities have more national and less international collaboration than the European ones. However, for the European universities there are no impact of national size although the countries differ much in scientific size. This deviation from the general trend indicates that the above-mentioned explanation is too simple and that national scientific size does not correlate negatively with the amount of international research collaboration without exceptions.

Keywords: Collaboration, Comparison, Correlation, General, Impact, International Collaboration, Made, Research, Research Collaboration, Size, Trend, Universities

Schubert, A. (1999), On science journals in science journals 1980-1998. *Scientometrics*, **46** (1), 171-212.

Full Text: [1999\Scientometrics46, 171.pdf](1999/Scientometrics46,%20171.pdf)

Keywords: Science

Wagner-Dobler, R. and Berg, J. (1999), Physics 1800-1900: A quantitative outline. *Scientometrics*, **46** (2), 213-285.

Full Text: [1999\Scientometrics46, 213.pdf](1999/Scientometrics46,%20213.pdf)

Abstract: The authors utilize the index of the Catalogue of Scientific papers of the Royal Society of London dealing with the physics journal literature of the 19th century. Graphs of the publication activity of the entire 19th-century physics and of about 50 of its most important subareas are displayed, both the number of active contributors in each area, the number of papers and its share of publications of the entire 19th century physics are exhibited. Typical scientometric regularities such as ‘Lotka’s law’ (with regard to the number of papers and the number of areas treated by physicists) are confirmed. In addition, the shares of the leading countries of important physical discoveries in the 19th century are studied.

Keywords: Activity, Index, Journal, London, Physical, Publication, Publications

? Bird, J.E. and Bird, M.D. (1999), Do peer-reviewed journal papers result from meeting abstracts of the biennial conference on the biology of marine mammals? *Scientometrics*, **46** (2), 287-297.

Full Text: [1999\Scientometrics46, 287.pdf](1999/Scientometrics46,%20287.pdf)

Abstract: Peer-reviewed publication is at the core of scientific communication. However, with the exception of biomedicine, there has been little analysis of the rate of peer-reviewed publication resulting from conference abstracts. This study examined a random sample of abstracts from the 1989 and 1991 Biennial Conferences on the Biology of Marine Mammals to determine how many were published as peer-reviewed papers. Publication rates were 51.4% (±4.7%) and 51.2% (±4.6%) respectively. This low abstract-to-publication rate, coupled with editorial policies prohibiting citation of conference abstracts in some journals, limits access to recent research, and thus affects the vibrance of the discipline.

Keywords: Access, Analysis, Biology, Biomedicine, Citation, Communication, Core, Editorial Policies, Fate, Journal, Low, Mammals, Marine, Marine Mammals, Publication, Random Sample, Recent, Research, Scientific Communication

de Moya-Anegón, F. and Herrero-Solana, V. (1999), Science in America Latina: A comparison of bibliometric and scientific-technical indicators. *Scientometrics*, **46** (2), 299-320.

Full Text: [1999\Scientometrics46, 299.pdf](1999/Scientometrics46,%20299.pdf)

Abstract: Latin-American scientific achievement is generally under-represented in databases for a number of reasons pointed out in our study. In this paper we analyze Latin-American scientific production in terms of input (resources) and output (publications). The indicators used were: Gross Domestic Product (GDP), economically active population (EAP), percentage of GNP destined to R+D, and total number of researchers dedicated to R+D. These indicators were subjected to bivariant analysis to determine the degree of correlation with the number of ISI publications.

Keywords: Achievement, Analysis, Bibliometric, Citation Analysis, Comparison, Correlation, Databases, Developing-Countries, GDP, Impact, Indicators, International Collaboration, ISI, Mathematics, Output, Paper, Population, Production, Publications, Scientific Production, World Science

Yurtsever, E. and Gülgöz, S. (1999), The increase in the rate of publications originating from Turkey. *Scientometrics*, **46** (2), 321-336.

Full Text: [1999\Scientometrics46, 321.pdf](1999/Scientometrics46,%20321.pdf)

Abstract: The scientific publications of 231 chemistry professors employed at Turkish Universities are studied for a period of 10 years. The quantitative as well as the qualitative aspects of the trends in the scientific information output of this group are analyzed in order to evaluate the underlying facts of the recent increase in the number of publications coming from Turkey. The selected group is a fairly good representative of the Turkish scientific community and our observations could be generalized to describe the development of basic sciences in Turkey. We conclude that even though there exists a serious increase in the scientific output from Turkey, a rather small portion of the studied group is responsible both for high number of publications and for higher quality.

Keywords: Citation Analysis, Community, Countries, Development, Group, Information, Journal Impact, Order, Output, Publications, Qualitative, Quality, Recent, Science, Sciences, Scientific Information, Scientific Output, Scientific Publications, Trends, Turkey, World

Bookstein, A. and Yitzhaki, M. (1999), Own-language preference: A new measure of ‘relative language self-citation’. *Scientometrics*, **46** (2), 337-348.

Full Text: [1999\Scientometrics46, 337.pdf](1999/Scientometrics46,%20337.pdf)

Abstract: A significant portion of scientometrics research involves studies of relative citation rates to groups of citable items. This paper examines the relative citation rates to own-language as compared to foreign language materials. A simple probabilistic model of citation behavior is defined, which suggests a natural measure of relative citation rate. Unlike earlier indicators, our measure is independent of the size of the base population.

Keywords: Base, Behavior, Citation, Groups, Indicators, Language, Materials, Model, Natural, Paper, Population, Preference, Research, Scientometrics, Size

Fernández-Cano, A. and Bueno, A. (1999), Synthesizing scientometric patterns in Spanish educational research. *Scientometrics*, **46** (2), 349-367.

Full Text: [1999\Scientometrics46, 349.pdf](1999/Scientometrics46,%20349.pdf)

Abstract: Educational research systems as the Spanish one can be studied using scientometric tools. Here 41 secondary-bibliometric studies are synthesized in a tertiary study, which could illuminate the nature of this research system, revealing at the same time its underlying framework. A clustering procedure reveals how this system has been scientometrically approached through the time.

Keywords: Clustering, Research, Tools

Bar-Ilan, J. and Peritz, B.C. (1999), The life span of a specific topic on the Web: The case of ‘informetrics’: A quantitative analysis. *Scientometrics*, **46** (3), 371-382.

Full Text: [1999\Scientometrics46, 371.pdf](1999/Scientometrics46,%20371.pdf)

Abstract: In this case study a first attempt was made to explore data on the Web for a certain period of time by using bibliometric methods for analysis. The period under investigation was between January 3, 1998 and June 7, 1998. An additional search was carried out on June 20, 1999. The terms used were ‘informetrics or informetric’. The results show that substantial changes occurred to the ‘literature on the Web’ on informetrics during this period. Three specific trends were observed: some documents disappeared, new ones were added and some underwent changes.

Keywords: Analysis, Bibliometric, Bibliometric Methods, Case Study, Informetrics, Investigation, Life, Made, Methods, Overlap, Quantitative Analysis, Search Engines, Trends

? Bordons, M., Zulueta, M.A., Romero, F. and Barrigon, S. (1999), Measuring interdisciplinary collaboration within a university: The effects of the Multidisciplinary Research Programme. *Scientometrics*, **46** (3), 383-398.

Full Text: [1999\Scientometrics46, 383.pdf](1999/Scientometrics46,%20383.pdf)

Abstract: A Multidisciplinary Research Programme (MRP) is being developed since 1989 in the Universidad Complutense de Madrid (UCM), Spain, to support cross-disciplinary research projects. This paper analyses the incidence of interdisciplinarity in the UCM scientific publications over the period 1990-96 and tries to determine the success of the Programme at fostering cross-disciplinary research. Interdisciplinary in the UCM is measured through the collaboration of authors from different institutional addresses within the UCM, both in scientific publications and in research projects. Publications jointly signed by the different teams that collaborate in the projects were identified as an indicator of the success of the Programme in integrating disciplines, interdisciplinary collaboration within the UCM showed an upward trend over time. Publications of MRP groups showed a higher interdisciplinary collaboration rate than the rest of the UCM (17% vs. 9%). Dramatic repercussions of the Programme were not expected due to its limited magnitude, but it worked as a catalyst, enhancing interdisciplinary relations within the UCM. The interest of such a programme is supported by its effects, both direct effects on granted teams and indirect on the whole UCM community.

Keywords: Catalyst, Collaboration, Community, Effects, Groups, Incidence, Indicator, Interdisciplinary, Interdisciplinary Collaboration, Madrid, MRP, Paper, Publications, Research, Research Projects, Science, Scientific Publications, Spain, Support, Trend

Davis, M., Wilson, C.S. and Hood, W.W. (1999), Ophthalmology and optics: An informetric study of Australia’s contribution to fields in the vision science domain, 1991-95. *Scientometrics*, **46** (3), 399-416.

Full Text: [1999\Scientometrics46, 399.pdf](1999/Scientometrics46,%20399.pdf)

Abstract: The paper provides data from a first exploration of the literature of Vision Science as seen bibliometrically through the ISI’s three citation indexes, SCI, SSCI, & AHCI. The main focus of analysis is on the major fields of Ophthalmology and Optics (SC=OPTICS and SC=OPHTHALMOLOGY) with a focus on Australia’s contribution to those literatures. Australia’s publication frequency vis-a-vis the world, its collaboration with authors from other nations, and the journals in which Australians most frequently publish are shown. Comparison of productivity is made for countries of similar scientific stature, or of language and Commonwealth status.

Keywords: Analysis, Citation, Citation Indexes, Collaboration, Exploration, Language, Made, Optics, Paper, Productivity, Publication, SCI, Science, Vision

? Egghe, L. (1999), A model for measuring the congestion in library shelves. *Scientometrics*, **46** (3), 417-430.

Full Text: [1999\Scientometrics46, 417.pdf](1999/Scientometrics46,%20417.pdf)

Abstract: A model for measuring the congestion in library shelves after j years (j is an element of N) is obtained by taking j-fold convolutions of the distributions that describe the yearly growth of literature (e.g., periodicals, books on a certain topic,...) From this one can estimate the expected number of critical points in the shelf, after j years. One can also calculate the probability that there will be m (m is an element of N) critical points after j years. The paper closes by examining two concrete cases.

Keywords: Concrete, Distributions, Growth, Law, Model, Paper, Periodicals, Probability

? Glänzel, W., Schubert, A., Schoepflin, U. and Czerwon, H.J. (1999), An item-by-item subject classification of papers published in journals covered by the SSCI database using reference analysis. *Scientometrics*, **46** (3), 431-441.

Full Text: [1999\Scientometrics46, 431.pdf](1999/Scientometrics46,%20431.pdf)

Abstract: A serious shortcoming of bibliometric studies based on the Social Sciences Citation Index is the lack of a universally applicable subject classification scheme as individual papers are concerned. Moreover, the selective coverage of more than thousand scientific journals per annum proved to be an insuperable obstacle in the delimitation of social science subject areas. Subject classification of papers on the basis of assigning journals to subject categories (like those found in the various supplements of ISI databases) works well in case of fully covered and highly specialised journals in the social sciences, too, but fails for multidisciplinary and selectively covered journals. This study presents the results of an item-by-item subject classification approach, where assignment is based on the analysis of the subject categories of reference literature This analysis extends the results of an earlier study by the authors on the possibility of delimiting subfields in the hard and life sciences based on reference analysis. The assignment proved also reliable for a considerable share of literature in the social sciences. Due to the peculiarities of the database this share is lower in the SSCI than that in the SCI. Although an iterated application of the procedure is expected to increase the number of classifiable publications, it is suggested that in the social sciences the method should be used in combination with other means of subject assignment.

Keywords: Analysis, Application, Approach, Bibliometric, Bibliometric Studies, Classification, Coverage, Database, Databases, ISI, Journals, Life, Life Sciences, Literature, Multidisciplinary, Papers, Procedure, Publications, SCI, Science, Sciences, Scientific Journals, Social, Social Sciences, SSCI

Gómez, I., Sancho, R., Moreno, L. and Fernández, M.T. (1999), Influence of Latin American journals coverage by international databases. *Scientometrics*, **46** (3), 443-456.

Full Text: [1999\Scientometrics46, 443.pdf](1999/Scientometrics46,%20443.pdf)

Abstract: The coverage of Latin American journals by international databases influences the visibility of these countries’ scientific output, and has a direct effect in their activity index per scientific discipline. Local, regional and international character of the most visible Latin American journals in SCI expanded and restricted databases is analysed, as well as its influence in the percentage share of each country in certain disciplines. Suggestions to enhance visibility of local journals are presented.

Keywords: Activity, Databases, Index, Local, Output, Regional, SCI, Scientific Output, Visibility

? Hinze, S. (1999), Collaboration and cross-disciplinarity in autoimmune diseases. *Scientometrics*, **46** (3), 457-471.

Full Text: [1999\Scientometrics46, 457.pdf](1999/Scientometrics46,%20457.pdf)

Abstract: Collaboration and cross-disciplinarity are important features in autoimmune disease research. Taking co-authorship as an indicator for research collaboration, for selected European countries it was found that 91% to 99% of all publications are based on collaboration. International collaboration affects about 27% of all publications. Small countries like Sweden and Finland pursue international collaboration more intensively than larger countries like Germany or the UK. Different collaboration strategies were found for nationally co-authored papers, for instance, Germany seems to focus more on intra-departmental collaboration, while France and Italy have stronger inter-institutional links. About 54% of all publications are based on cross-disciplinary collaboration, which was found to be even more important in international collaboration.

Keywords: Co-Authorship, Collaboration, Disease, Diseases, Features, Finland, France, Germany, Indicator, International Collaboration, Italy, Publications, Research, Research Collaboration, Strategies, Sweden, UK

? Hood, W.W. and Wilson, C.S. (1999), The distribution of bibliographic records in databases using different counting methods for duplicate records. *Scientometrics*, **46** (3), 473-486.

Full Text: [1999\Scientometrics46, 473.pdf](1999/Scientometrics46,%20473.pdf)

Abstract: Knowing how records on a particular topic are distributed over databases is useful for both practical and theoretical reasons, however little work in this area appears to have been done. This paper examines the distribution of records on the topic of ‘Fuzzy Set Theory’ in over 100 bibliographic databases and determines whether the distribution of records over databases is similar to the traditional Bradford hyperbolic distribution of records over journals. Different methods for counting duplicate records between and within databases have been developed. A comparison of the various distributions based on these counting methods is presented, and the distributions are compared to results of earlier studies. The results also give an indication of the number of databases necessary to search for coverage of a literature to specified percentages using the different counting techniques developed in this study.

Keywords: Bibliographic Databases, Comparison, Databases, Distribution, Distributions, Hyperbolic, Issues, Methods, Paper, Techniques

Ingwersen, P. and Wormell, I. (1999), Publication behaviour and international impact: Scandinavian clinical and social medicine, 1988-96. *Scientometrics*, **46** (3), 487-499.

Full Text: [1999\Scientometrics46, 487.pdf](1999/Scientometrics46,%20487.pdf)

Abstract: The paper presents the results of an empirical study of the Danish and Nordic publication behaviour and international impact in Clinical and Social Medicine covering the period 1988-96. As indicators are applied the international visibility of Scandinavian research output, the publication activity per capita in SCI journals, the development over time of the national citation impact in an OECD and World context, and the ratio of cited papers relative to the World. Compared to May’s analysis (1997), covering 1981-94, the analysis shows that a certain reshuffle of national positions among the OECD countries in citation impact has occurred. UK and New Zealand as well as Denmark and Sweden have lost in ranking to Finland and Belgium, both countries coming up from behind. The most interesting results concern the opposite research policy strategies displayed by Finland and Denmark which result in similar impact patterns relative to the World impact. The implications are discussed.

Keywords: Activity, Analysis, Belgium, Citation, Clinical, Denmark, Development, Finland, Impact, Indicators, New Zealand, Output, Paper, Policy, Publication, Ranking, Research, SCI, Social, Strategies, Sweden, UK, Visibility

? Kretschmer, H. (1999), A new model of scientific collaboration Part 1. Theoretical approach. *Scientometrics*, **46** (3), 501-518.

Full Text: [1999\Scientometrics46, 501.pdf](1999/Scientometrics46,%20501.pdf)

Abstract: This study deals with the uniformity of the collaboration process within the scientist’s system by describing all two-dimensional and three-dimensional referential patterns with only one nonlinear function. The variety of these patterns is expressed in dependence upon the conditions or environment that induced them by means of varying the parameters of this non-linear function. Based on their similarity these various patterns can be divided into different types.

Keywords: Collaboration, Dependence, Environment, Function, Model, New Model, Non-Linear, Nonlinear, Parameters, Process, Scientific Collaboration, Similarity, Three-Dimensional, Uniformity

? Kundra, R. and Kretschmer, H. (1999), A new model of scientific collaboration Part 2. Collaboration patterns in Indian medicine. *Scientometrics*, **46** (3), 519-528.

Full Text: [1999\Scientometrics46, 519.pdf](1999/Scientometrics46,%20519.pdf)

Abstract: Collaboration in science has become a prevailing trend and it will be worthwhile to study the patterns of co-authorships in scientific research. In this study a three-dimensional behavioural pattern of Indian medicinal co-authorship network is presented. The high evenness of this pattern has caused us to carry out a non-linear regression analysis. The pattern of Indian medicinal co-authorships can be described by the same non-linear mathematical function that describes the behavioural patterns of international medicine co-authorship networks and networks of other scientific disciplines. The following question has arise: Is there a general validity of this function in co-authorship networks?

Keywords: Analysis, Co-Authorship, Co-Authorship Networks, Collaboration, Function, General, Model, New Model, Non-Linear, Non-Linear Regression, Nonlinear, Nonlinear Regression, Regression, Regression Analysis, Research, Science, Scientific Collaboration, Three-Dimensional, Trend, Validity

Lewison, G. (1999), The definition and calibration of biomedical subfields. *Scientometrics*, **46** (3), 529-537.

Full Text: [1999\Scientometrics46, 529.pdf](1999/Scientometrics46,%20529.pdf)

Abstract: This paper first explains the need to define subfields of science by means of ‘filters’ that selectively retrieve papers from a database, and then describes how such filters are constructed and calibrated. Good filters should have precision and recall of the order of 90% so as to be representative of a subfield, they are created by an interactive partnership between an expert in the subject and a bibliometrician. They are based primarily on the use of title keywords, often in combination rather than singly, and specialist journals. Their calibration depends on experts marking lists of papers extracted by the filter as relevant, don’t know or not relevant. This allows the actual size of a subfield to be estimated and hence the relative importance accorded to it within a major field of science. It permits organisations and countries to see their contributions to individual scientific subfields in detail

Keywords: Calibration, Fields, Filter, Impact, Importance, Interactive, Order, Paper, Precision, Science, Sciences, Scientific Publications, Size

? De Arenas, J.L., Valles, J. and Arenas, M. (1999), Profile of the Mexican health sciences elite: A bibliometric analysis of research performance. *Scientometrics*, **46** (3), 539-547.

Full Text: [1999\Scientometrics46, 539.pdf](1999/Scientometrics46,%20539.pdf)

Abstract: The most prestigious award in Mexico, the ‘National Prize for Science and Art’ has been awarded to 33 health scientists. An exercise was carried out to assess their performance to answer the question: why them? The laureates’ profile was based on data retrieved from MEDLINE and Science Citation Index Expanded available on the WWW as well as the ISI’s 15-year (1981-1995) cumulative impact factor lists. The laureates published 2,049 papers and were cited 50,834 times. Our results showed the scientific pre-eminence of laureates. We concluded that bibliometric data could complement other indicators of research performance. Bibliometrics could insure the Prize committee against error and the operationalization of the Matthew Effect could be minimized to honor only the most creative researchers.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Cumulative Impact, Exercise, Health, Health Sciences, Impact, Impact Factor, Indicators, Medline, Mexico, Performance, Prizes, Profile, Research, Research Performance, Science Citation Index, Sciences

Luwel, M. (1999), Is the science citation index US-biased? *Scientometrics*, **46** (3), 549-562.

Full Text: [1999\Scientometrics46, 549.pdf](1999/Scientometrics46,%20549.pdf)

Abstract: The Western European science policy establishment often claims that US articles are more Frequently cited than articles of the European Union’s scientists because they are published in journals with a large number of US publications and that these journals are forming the ‘core’ of the SCI.

For the disciplines covered by the SCI, no significant correlation has been found between the ratio of the average number of citations per publication for publications with at least one EU address and at least one US address, respectively, on the one hand, and, on the other hand, the ratio of the corresponding number of publications per journal.

Keywords: Citation, Citations, Core, Correlation, Eu, Hand, Index, Journal, Journals, Performance, Policy, Publication, Publications, SCI, Science, Science Citation Index, Science Policy, Science-Policy, US

Macias-Chapula, C.A., Sotolongo-Aguilar, G.R., Magde, B. and Solorio-Lagunas, J. (1999), Subject content analysis of AIDS literature, as produced in Latin America and the Caribbean. *Scientometrics*, **46** (3), 563-574.

Full Text: [1999\Scientometrics46, 563.pdf](1999/Scientometrics46,%20563.pdf)

Abstract: The purpose of this paper is to present the preliminary results of a research in progress regarding the subject content analysis of AIDS literature, as produced in or about the Latin American and Caribbean (LAC) region. An AIDSLINE/OVID literature search was conducted to obtain only the Medical Subject Headings (MeSH) -geographic- terms related to the LAC region. The period of study was from 1982 to June, 1998

Indicators regarding the distribution of records throughout the years of study, as well as the subject, check tags, and subject/subheadings distribution patterns were analysed. This was done through rile application of a modular bibliometric information system, as well as the applications of Biblio-Link for Windows, Version 1.2 1994-1997, Research Information Systems, Pro-Cite for Windows, Version 4.0.1 1995-1998, Research Information Systems, and Microsoft EXCEL 97, of 1985-1998, Microsoft Corporation.

A total of 4124 records were obtained and analysed. In descending order, Brazil, Mexico, Haiti, Argentina and Puerto Rico, generated the highest number of citations. Highly ranked MeSH subject headings were Risk Factors, Acquired Immunodeficiency Syndrome, Sex Behavior, Support, Non US. Govt., HIV Infections, and Developing Countries.

Results demonstrate that major research concerns centred on the epidemiological aspects and transmission of AIDS, and more recently, on the prevention and control of the disease. A switch of the studies from male to female, and from middle age to adolescence was also observed. The authors provide further lines of research.

Keywords: Adolescence, Age, AID, AIDS, Analysis, Applications, Argentina, Bibliometric, Brazil, Caribbean, Citations, Content Analysis, Control, Disease, Distribution, Distribution Patterns, Female, HIV, Immunodeficiency-Syndrome Aids, Information, Information System, Latin America, Male, Mexico, Order, Paper, Prevention, Puerto Rico, Research, US

Moed, H.F., Van Leeuwen, T.N. and Reedijk, J. (1999), Towards appropriate indicators of journal impact. *Scientometrics*, **46** (3), 575-589.

Full Text: [1999\Scientometrics46, 575.pdf](1999/Scientometrics46,%20575.pdf)

Abstract: This paper reviews a range of studies conducted by the authors on indicators reflecting scholarly journal impact. A critical examination of the journal impact data in the Journal Citation Reports (JCR), published by the Institute for Scientific Information (ISI) has shown that the JCR impact factor is inaccurate and biased towards journals revealing a rapid maturing or decline in impact. In addition, it was found that the JCR cited half life is an inappropriate measure of decline of journal impact. More appropriate impact measures of scholarly journals are proposed. A new classification system is explored, describing both maturing and decline of journal impact as measured through citations. Suggestions for future research are made, analysing in more detail the distribution of citations among papers in a journal.

Keywords: Citations, Classification, Distribution, Examination, Half-Life, Impact, Impact Factor, Indicators, Institute, Institute for Scientific Information, ISI, Journal, Journal Citation Reports, Life, Made, Obsolescence, Paper, Range, Research, Reviews, Scientific Literature

? Noyons, E., Moed, H. and Van Raan, A. (1999), Integrating research performance analysis and science mapping. *Scientometrics*, **46** (3), 591-604.

Full Text: [1999\Scientometrics46, 591.pdf](1999/Scientometrics46,%20591.pdf)

Abstract: In this paper we present the explorations of combining the two main pillars of evaluative bibliometrics. These two pillars, performance analysis and science mapping, both have their strengths and imperfections. In this study we show how these imperfections are dealt with by an integrated analysis.

Keywords: Analysis, Bibliometrics, Indicators, Mapping, Paper, Performance, Research, Research Performance, Science, Strengths, Subfields

? Rao, I.K.R. and Suma, M.P. (1999), A quantitative study of Indian engineering literature. *Scientometrics*, **46** (3), 605-619.

Full Text: [1999\Scientometrics46, 605.pdf](1999/Scientometrics46,%20605.pdf)

Abstract: In recent years, several projects were sponsored by NISSAT of the Goverment of India to map Indian Science. As a part of it, a database (COMPENDEX) in engineering field was analysed. It has been found that engineers in India publish their articles mostly in journals, almost all of them publish in English language. They publish in a selected few journals. Only a few of the institutions are concentrated in engineering research. It has been observed that research output in applied physics, light & optics, bioengineering and information science are increasing both at the world and India level. In the area of energy technology metallurgical engineering and food technology, research output is decreasing at both levels.

Keywords: Energy, Engineering, Food, India, Information, Information Science, Institutions, Language, Levels, Light, Optics, Output, Recent, Research, Science

Vinkler, P. (1999), Ratio of short term and long term impact factors and similarities of chemistry journals represented by references. *Scientometrics*, **46** (3), 621-633.

Full Text: [S\Scientometrics46, 621.pdf](S/Scientometrics46,%20621.pdf)

Abstract: Some important bibliometric characteristics of chemistry journals were studied. Contrary to expectations, calculations of impact factors asynchronized for shorter and longer periods yield similar values. A new overlap measure for journals is suggested which is based on frequency distribution of references by journals.

Keywords: Bibliometric, Characteristics, Distribution, Impact, Impact Factors, Long-Term, Scientometric Indicators, Subfields, Yield

? Wagner-Döbler, R. (1999), William Goffman’s ‘Mathematical Approach to the Prediction of Scientific Discovery’ and its application to logic, revisited. *Scientometrics*, **46** (3), 635-645.

Full Text: [1999\Scientometrics46, 635.pdf](1999/Scientometrics46,%20635.pdf)

Abstract: Based on the observation of regular ‘epidemic’ recurrence of activity in the history of symbolic logic, a new wave of logic activity was predicted by Goffman in 1971 for the coming years. This prediction is examined and confirmed to some extent. It is shown, however, that the whole mathematics came in a wave-like fashion in the last 200 years, that the main fluctuations of logic were isochronic with the main fluctuations of mathematics, and, in addition, that fundamental logic contributions appeared on the top of the waves. After considering some problems of time-series analysis, relationships to business cycles of the Kondratiev, Kuznets, and Juglar types are discussed.

Keywords: Activity, Analysis, History, Observation, Prediction, Recurrence, Time Series Analysis, Time-Series, Waves

Wilson, C.S. (1999), Using online databases to form subject collections for informetric analyses. *Scientometrics*, **46** (3), 647-667.

Full Text: [1999\Scientometrics46, 647.pdf](1999/Scientometrics46,%20647.pdf)

Abstract: The online databases of the Dialog System retrieve only 26% of documents in an exhaustively compiled collection on the subject of Bradford’s Law of Scattering, with some documents being retrieved from many databases. However, when the Exhaustive Collection is more stringently defined to include only those documents more about the subject, the retrieval rate of Dialog improves to 61%, while its most productive database, LISA, alone retrieves 37%. Both of these ‘samples’ give good estimates of the size-invariant properties of the Exhaustive Collection which are typically studied in Bradford and Growth Analyses - vindicating this use of online searching. However, without additional information, online searches are of little use in determining size-related properties of subject literature collections. Whether the analysis reported here - which relies on identical interpretations of a ‘subject’ - has secure foundations is briefly considered.

Keywords: Analysis, Databases, Information, Models, Properties, Searching

? Zitt, M. and Bassecoulard, E. (1999), Internationalization of communication - A view on the evolution of scientific journals. *Scientometrics*, **46** (3), 669-685.

Full Text: [1999\Scientometrics46, 669.pdf](1999/Scientometrics46,%20669.pdf)

Abstract: Starting from a characterization of the level of internationalization of SCI journals, based on their authoring scope, the process of internationalization of scientific communication throughout the period 1981-97 is described. The growth of the classes of international journals at the expense of national-oriented ones, appears as a general trend in all disciplines. A kindred measure of internationalization at the country-level is proposed, based on the balance of country-authored publications between national-oriented and international-oriented journals. A typology of countries is sketched. The general trend towards internalionalization is also clear at the country level. It can be generally interpreted as a positive evolution, with some exceptions as Russia in the recent period, where it appears together with the output decline, a counterpart of the disappearance of many journals from SCI. Some other examples of shocks with a covariation of internationalization and output are given. Country internationalization indexes also express the sensitivity of the country output indicators to the possible restriction of SCI sample to the international fraction. Considering evolutions of internationalization may be helpful for a comprehensive study of scientific long-term evolutions at the country level.

Keywords: Balance, Characterization, Citation, Communication, Countries, Evolution, Fraction, General, Growth, Impact, Indicators, Long-Term, Output, Process, Publication, Publications, Recent, Restriction, Russia, SCI, Scientific Communication, Sensitivity, Set, Trend, Typology

? Ramirez, A.M., Garcia, E.O. and Del Rio, J.A. (2000), Renormalized impact factor. *Scientometrics*, **47** (1), 3-9.

Full Text: [2000\Scientometrics47, 3.pdf](2000/Scientometrics47,%203.pdf)

Abstract: Many aspects determine the quality of scientific journals. The impact factor is one of these quantitative parameters. However, the impact factor has a strong dependence on the journal discipline. This dependence forbids a direct comparison between different journals without introducing external considerations. In this paper, a renormalized impact factor, F-r, inspired in the definition of dimensionless physical parameters, is proposed. F-r allows a direct comparison among journals classified into different categories and, furthermore, the time evolution analysis of the journal’s role in its field.

Keywords: Analysis, Citation Analysis, Comparison, Dependence, Evolution, Impact, Impact Factor, Journal, Journals, Paper, Parameters, Physical, Quality, Role

Clavería, L.E., Guallar, E., Camí, J., Conde, J., Pastor, R., Ricoy, J.R., Rodríguez-Farré, E., Ruiz-Palomo, F. and Muñoz, E. (2000), Does peer review predict the performance of research projects in health sciences? *Scientometrics*, **47** (1), 11-13.

Full Text: [S\Scientometrics47, 11.pdf](S/Scientometrics47,%2011.pdf)

Abstract: Peer review is a basic component of the scientific process, but its performance has seldom been evaluated systematically. To determine whether pre-approval characteristics of research projects predicted the performance of projects, we conducted a retrospective cohort study of all 2744 single-centre research projects financed by the Spanish Health Research Fund since 1988 and completed before 1996. Peer review scores of grant applications were significant predictors of performance of funded projects, and the likelihood of production was also higher for projects with a basic research component, longer duration, higher budget or a financed research fellow. Funding agencies should monitor their selection process and assess the performance of funded projects to design future strategies in supporting health sciences research.

? Eto, H. (2000), Authorship and citation patterns in operational research journals in relation to competition and reform. *Scientometrics*, **47** (1), 25-42.

Full Text: [2000\Scientometrics47, 25.pdf](2000/Scientometrics47,%2025.pdf)

Abstract: Authorship and citation patterns in major journals in operational research (OR) are analysed. As a forerunner of interdisciplinary specialties applying mathematical or quantitative methods to social problems, OR has recently been in severe competition with new challengers with respect to applicable methods and real implementation. Through the analyses of authorship and citation patterns, this paper discusses behaviours of the journal editors and contributors with regard to the competition and reform policy of OR journals.

Keywords: Authorship, Citation, Competition, Flagship Journals, Implementation, Interdisciplinary, Journal, Methods, Model, OR, MS, Paper, Policy, Research, Research Journals, Research Perspective, Social, Social Problems, Systems

? Pollmann, T. (2000), Forgetting and the ageing of scientific publications. *Scientometrics*, **47** (1), 43-54.

Full Text: [2000\Scientometrics47, 43.pdf](2000/Scientometrics47,%2043.pdf)

Abstract: In this paper, I will argue that the process of ageing in scientific publications on the one hand, and the process of obsolescence and forgetting to which all kinds of phenomena, people and events are exposed on the other, develop with the same speed. Whereas in the literature on the subject it is stared that the speed of the ageing of scientific literature is exponential, it is shown that the decay from ‘age 4’ is best described by an inverse function, as was already brought to light in reference to forgetting of people and events as measured by the frequencies of calendar years in large text corpora. The empirical bases are SCI data as presented by Nakamoto and various files of reference data collected by the author. It is shown that the decay curve of the reference frequencies from ‘age 4’ backwards is independent of time.

Keywords: Age, Ageing, Backwards, Citation, Decay, Function, Hand, Light, Obsolescence, Paper, Process, Publications, Reference, SCI, Scientific Publications, Speed

Ding, Y., Chowdhury, G.G. and Foo, S. (2000), Journal as markers of intellectual space: Journal co-citation analysis of information Retrieval area, 1987-1997. *Scientometrics*, **47** (1), 55-73.

Full Text: [S\Scientometrics47, 55.pdf](S/Scientometrics47,%2055.pdf)

Abstract: A journal co-citation analysis of fifty journals and other publications in the information retrieval (IR) discipline was conducted over three periods spanning the years of 1987 to 1997. Relevant data retrieved from the Science Citation Index (SCI) and Social Science Citation Index (SSCI) are analysed according to the highly cited journals in various disciplines, especially in the Library gi Information Science area. The results are compared with previous research that covered the data only from the Social Science Citation Index (SSCI). The analysis reveals that there is no distinct difference between these two sets of results. The results of current study show that IR speciality is multi-disciplinary with broad relations with other specialities. The field of IR is a mature field, as the journals used for research communication remained quite stable during the study period.

Keywords: Cocitation Analysis, Science

Jacobs, D. and Ingwersen, P. (2000), A bibliometric study of the publication patterns in the sciences of South African scholars 1981-96. *Scientometrics*, **47** (1), 75-93.

Full Text: [S\Scientometrics47, 75.pdf](S/Scientometrics47,%2075.pdf)

Abstract: The paper is a bibliometric study of the publication patterns and impact of South African scientists 1981-96, with special emphasis on the period 1992-96. The subject fields surveyed are Physics, Chemistry, Plant and Animal Sciences, and Biochemistry/Microbiology. Scientists were selected from the ten universities of the Eastern Cape, Western Cape and KwaZulu Natal, which vary considerably, with respect to standards of education, quantity of publications, development and overall progress. The general purpose is two-fold: 1) to observe the publication and citation trends during 1981-96, a period which covers significant policy changes in the country, in particular the end of apartheid 1994, within this context 2) to investigate the patterns used by scientists 1992-96 from these different institutions in publishing the results of their research in the form of conference papers or (inter)national journals. The study collected two sets of data through a scientometric analysis of Science Citation Index and a questionnaire. With the exception of Physics, the results demonstrate a decreasing South African world share, in particular for Plant & Animal Sc. publications, and a similar decline of citations starting in 1986/87. Further, the citation impact relative to the world, after a substantial drop 1985-93 probably representing the international embargo period, in 1994-96 reaches the same level as observed in 1985-89. Also, the study shows that there is a direct relation between academic position, research experience and productivity among South African Scientists in the four scientific disciplines.

? Banerjee, P., Gupta, B.M. and Garg, K.C. (2000), Patent statistics as indicators of competition an analysis of patenting in biotechnology. *Scientometrics*, **47** (1), 95-116.

Full Text: [2000\Scientometrics47, 95.pdf](2000/Scientometrics47,%2095.pdf)

Abstract: Numbers of patents cannot indicate the state of research or the contents of patent documentation cannot indicate the true technological features achieved. Patent statistics though so used, is not a good indicator of the economic returns to investments in research. Use of this statistics for understanding the degree of competition and the competition-driven research strategy is attractive. A patent document is part of the public knowledge in such a way as to restrict the growth of the future public knowledge. This portent on the future content of research and on the number and areas of research, by a current application is a competition-defining aspect. This effect on the lagged future applications and accepting patent disclosure as an intentional strategic data - are the most significant characteristics of patent statistics. The present paper applied this understanding, and generated a number of indices derived from data bases on patenting. These are indicators on Competition, Technology Pool, Language Technology Pool, Modified Competition, Market Attractiveness and on the Strength of Patent Market. Values of these indicators for biotechnological research and for several countries have been derived as example.

Keywords: Analysis, Applications, Biotechnology, Characteristics, Competition, Current, Economic, Features, Growth, Indicator, Indicators, Innovative Activities, Knowledge, Paper, Patents, R-and-D, Research, Restrict, Statistics, Strategy

? Shirabe, M. and Fujigaki, Y. (2000), The introduction of economic methods to scientometrics: The citing-cited table and the autopoietic systems of citations. *Scientometrics*, **47** (1), 117-130.

Full Text: [2000\Scientometrics47, 117.pdf](2000/Scientometrics47,%20117.pdf)

Abstract: The paper is introducing an economic method (interindustry relations analysis) into studies of autopoietic systems and shows its application to scientometrics, which can also be regarded as the analysis of autopoietic systems. The merit of the application is discussed, and the outline of the proof of a related theorem is suggested in the appendix.

Keywords: Analysis, Citations, Economic, Knowledge, Methods, Paper, Science, Scientometrics

? Bhattacharya, S., Pal, C. and Arora, J. (2000), Inside the frontier areas of research in physics: A micro level analysis. *Scientometrics*, **47** (1), 131-142.

Full Text: [2000\Scientometrics47, 131.pdf](2000/Scientometrics47,%20131.pdf)

Abstract: In an earlier study,(1) a methodology was described for identifying Frontier Areas in a research field, i.e., areas which experienced in a particular time period significant increase in research output in comparison to a preceding time period. The application of this methodology was shown by identifying Frontier Areas of research in Physics in 1995. Comparison was done with respect to the outputs in different areas in 1990, Profiles of countries active in the identified Frontier Areas were then constructed. In this paper, attempt is made to reveal the active research topics/themes within these Frontier Areas in 1990 and 1995. The active research topics, which are uncovered, are classified as Frontier Topics. Countries active in these frontier topics are distinguished in each time period. Association among countries and Frontier Topics are observed using the multivariate technique of correspondence analysis. Dynamics are observed by analysing the changes in the profiles of the countries in the two time periods. Results and implications of this study for decision-making and as a policy tool are highlighted.

Keywords: Analysis, Comparison, Decision Making, Decision-Making, Made, Methodology, Multivariate, Output, Paper, Policy, Profiles, Research

? Lin, Y. and Kaid, L.L. (2000), Fragmentation of the intellectual structure of political communication study: Some empirical evidence. *Scientometrics*, **47** (1), 143-164.

Full Text: [2000\Scientometrics47, 143.pdf](2000/Scientometrics47,%20143.pdf)

Abstract: This study applies a method of author co-citation analysis to examine the intellectual structure of political communication study. Fifty one influential authors were selected from active members of the Political Communication Divisions of the International Communication Association (ICA) the National Communication Association (NCA), and the American Political Science Association (APSA). The results of the multidimensional scaling analysis and cluster analysis of these 51 selected authors’ co-citation patterns show that intellectual fragmentation exists in political communication research, scholars with different academic backgrounds exhibit specialties using particular research approaches to study certain subjects in the field: scholars do not have much information exchange, and thus they are intellectually separate and confined within the boundaries of each fragment. The findings of this quantitative study complements and cross-validates the assessment made by other traditional qualitative reviews about the field.

Keywords: Academic, Analysis, Assessment, Citation Networks, Cluster, Cluster Analysis, Co-Citation, Co-Citation Analysis, Cocitation, Communication, Fragmentation, Information, Information Exchange, Intellectual Structure, Journals, Made, Qualitative, Research, Reviews, Scaling, Structure

? Sangam, S.L. (2000), Emerging trends in scientometrics: Essays in honour of Dr. Ashok Jain. *Scientometrics*, **47** (1), 165-166

Full Text: [2000\Scientometrics47, 165.pdf](2000/Scientometrics47,%20165.pdf)

Keywords: Scientometrics, Trends

van den Besselaar, P. (2000), Communication between science and technology studies journals: A case study in differentiation and integration in scientific fields. *Scientometrics*, **47** (2), 169-193.

Full Text: [2000\Scientometrics47, 169.pdf](2000/Scientometrics47,%20169.pdf)

Abstract: This paper analyzes the communication between science and technology journals (STS), to illustrate patterns of differentiation and integration within scientific fields. First the STS field is delineated, using journal-journal citations as the empirical base. A strong and increasing differentiation is found, between ‘qualitative STS’, ‘quantitative STS’ (scientometrics), and ‘S&T policy studies’. Given this process of differentiation. the relations between the three sub-fields of STS are analyzed, in terms of mutual flows of information, the joint information base, and research topics. Is differentiation and codification of sub-fields visible? The findings suggest that the relations between qualitative and quantitative STS are one-sided, and that integration between the sub-fields is almost completely lacking. However, the relations between scientometrics and S&T policy studies are much stronger and more substantial, and the same is the case for scientometrics and information science.

Keywords: Journals, Research, Scientometrics

? Bogaert, J., Rousseau, R. and Van Hecke, P. (2000), Percolation as a model for informetric distributions: Fragment size distribution characterised by Bradford curves. *Scientometrics*, **47** (2), 195-206.

Full Text: [2000\Scientometrics47, 195.pdf](2000/Scientometrics47,%20195.pdf)

Abstract: It is shown how Bradford curves, i.e. cumulative rank-frequency functions, as used in informetrics, can describe the fragment size distribution of percolation models. This interesting fact is explained by arguing that some aspects of percolation can be interpreted as a model for the success-breeds-success or cumulative advantage phenomenon. We claim, moreover, that the percolation model can be used as a model to study (generalised) bibliographies. This article shows how ideas and techniques studied and developed in informetrics and scientometrics can successfully be applied in other fields of science, and vice versa.

? Van Borm, J., Corthouts, J. and Philips, R. (2000), Performance measurement in the Belgian document ordering and delivery system Impala. *Scientometrics*, **47** (2), 207-225.

Full Text: [2000\Scientometrics47, 207.pdf](2000/Scientometrics47,%20207.pdf)

Abstract: This paper deals with performance measures and performance indicators in the Impala electronic document ordering and delivery system for research libraries in Belgium and compares these with some international standards as, e.g., the ProLib/Pi study commissioned by the European Commission. Performance measures: Costs(clearinghouse principle) Number of ILL requests made to other libraries Number of ILL requests made to other libraries without success Number of ILL requests made to other libraries with success Number of ILL requests received from other libraries Number of ILL requests received from other libraries and not satisfied Number of ILL requests received from other libraries that were satisfied Frequently asked titles Performance indicators: Success rate Borrowing-lending ratio per library Response times, split into several segments of the ILL-procedure The article concludes with some indications for quality measurement in electronic document delivery where Impala will be able to measure the real supply times as perceived by the end user.

Keywords: Belgium, Document Delivery, European Commission, Ill, Indicators, International Standards, Libraries, Made, Measurement, Opinion Paper, Paper, Performance, Performance Indicators, Performance Measures, Quality, Research, Standards

? Bra, P. (2000), Using hypertext metrics to measure research output levels. *Scientometrics*, **47** (2), 227-236.

Full Text: [2000\Scientometrics47, 227.pdf](2000/Scientometrics47,%20227.pdf)

Abstract: Two common ways to measure the ‘output’ of a researcher (or research group) are to count numbers of publications and to count the citations (references to these publications in publications of others). These simple methods are flawed because they cannot easily take into account the differences in publication and citation habits in different scientific communities. An alternative approach is to view citations as hypertext links. and to use or adapt hypertext metrics to compare the scientific output of researchers, in comparison to that of others in areas with similar publication and citation patterns. We show how hypertext metrics, introduced by Botafogo, Rivlin and Shneiderman, can be modified in order to identify comparable research fields based on their publication and citation pattern. An author’s performance can then be compared to that of others in research fields with a similar pattern.

Keywords: Citation, Citations, Communities, Comparison, Group, Levels, Methods, Metrics, Modified, Order, Output, Performance, Publication, Publications, Research, Scientific Output

? Egghe, L. (2000), The distribution of N-grams. *Scientometrics*, **47** (2), 237-252.

Full Text: [2000\Scientometrics47, 237.pdf](2000/Scientometrics47,%20237.pdf)

Abstract: N-grams are generalized words consisting of N consecutive symbols, as they are used in a text. This paper determines the rank-frequency distribution for redundant N-grams. For entire texts this is known to be Zipf’s law (i.e., an inverse power law). For N-grams, however, we show that the rank (r)-frequency distribution is P-N(r)=C/(psi(N)(r))(beta), where psi(N) is the inverse function of f(N)(x)=x ln(N-1)x. Here we assume that the rank-frequency distribution of the symbols follows Zipf’s law with exponent beta.

Keywords: Central-Limit-Theorem, Distribution, Function, Information-Retrieval, Law, Paper, Rank, Similarity, Zipfs Law

? Jansz, M.C.N. (2000), Some thoughts on the interaction between scientometrics and science and technology policy. *Scientometrics*, **47** (2), 253-264.

Full Text: [2000\Scientometrics47, 253.pdf](2000/Scientometrics47,%20253.pdf)

Abstract: In 1988 Le Pair postulated the existence of a citation gap for technological research. Several cases were studied, which confirmed his hypothesis. In the same period the use of bibliometric indicators for policy purposes increased. Here we saw the citation gap causing a disadvantage for application-oriented research groups. This is not merely an injustice, it also leads to suboptimum use of available funds, to the detriment of science as a whole. In addition, it may, in the long term, undermine the reputation of scientometrics as a science ih its own right.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Groups, Indicators, Interaction, Long-Term, Policy, Research, Science, Scientometrics, Technology Policy

? Leydesdorff, L. (2000), Is the European Union becoming a single publication system? *Scientometrics*, **47** (2), 265-280.

Full Text: [2000\Scientometrics47, 265.pdf](2000/Scientometrics47,%20265.pdf)

Abstract: Using percentage performance shares of individual member states, the European Union can be assessed as if it were a network publication system. The prediction of systemness (based on the Markov property of the distribution) can be tested against the predictions of trend lines for individual nations. The publication performance of the EU can also be compared to that of the USA and Japan. The results suggest that a comparison with (global) world trade is important for understanding developments between the various R&D systems. Predictions for the 1999 indicator values are also provided.

Keywords: Citation, Comparison, Distribution, Eu, European Union, Global, Indicator, Japan, Networks, Performance, Prediction, Predictions, Publication, Science, Trend, USA

? Luwel, M. (2000), A bibliometric profile of Flemish research in natural, life and technical sciences. *Scientometrics*, **47** (2), 281-302.

Full Text: [2000\Scientometrics47, 281.pdf](2000/Scientometrics47,%20281.pdf)

Abstract: This paper presents an overview of recent R&D policy developments in Flanders and Belgium. Special attention is paid to evaluation and monitoring, which are seen as central elements of the Flemish Government’s more dynamic science and technology policy. The paper describes the process of setting up the necessary instruments to perform bibliometric studies and the application of these instruments for drawing a profile of the natural, life and technical sciences research carried out in Flanders. Although the total publication output weighted by population or regional wealth, is still lower than that of other small, highly industrialised countries, the international visibility of this research is comparable, if not slightly higher.

Keywords: Attention, Belgium, Bibliometric, Bibliometric Studies, Dynamic, Elements, Evaluation, Flanders, Life, Monitoring, Natural, Output, Paper, Policy, Population, Process, Profile, Publication, Recent, Regional, Research, Research Performance, Science, Sciences, Technology Policy, Visibility

? Malo, S. and Geuna, A. (2000), Science-technology linkages in an emerging research platform: The case of combinatorial chemistry and biology. *Scientometrics*, **47** (2), 303-321.

Full Text: [2000\Scientometrics47, 303.pdf](2000/Scientometrics47,%20303.pdf)

Abstract: This article focuses on issues concerning science and technology relationships posed by the emergence of a new drug discovery method, namely, combinatorial chemistry and biology. We assess the scientific content of combinatorial chemistry and biology using citations in patents to scientific journals and compare this research platform with biotechnology. We also identify the institutional affiliation of all the authors of the cited papers, which leads us to an analysis of knowledge spillovers between the main participants in the research network. Finally, we examine the relevance of localisation in the process of knowledge exchange with regard to EU countries and the US. The result of the analysis provides evidence to support the view that the inventive capacity of a country is dependent upon the basic research which is carried out, especially in universities and public research centres located in the inventor’s country.

Keywords: Analysis, Antigens, Basic Research, Biology, Biotechnology, Capacity, Citations, Combinatorial Chemistry, Drug, Drug Discovery, Emergence, EU, General-Method, Innovation, Knowledge, Libraries, Patents, Process, Research, Science, Solid-Phase Synthesis, Support, Universities, US

? Moed, H.F. (2000), Bibliometric indicators reflect publication and management strategies. *Scientometrics*, **47** (2), 323-346.

Full Text: [2000\Scientometrics47, 323.pdf](2000/Scientometrics47,%20323.pdf)

Abstract: In a bibliometric study of nine research departments in the field of biotechnology and molecular biology, indicators of research capacity, output and productivity were calculated, taking into account the researchers’ participation in scientific collaboration as expressed in co-publications. In a quantitative approach, rankings of departments based on a number of different research performance indicators were compared with one another. The results were discussed with members from all nine departments involved. Two publication strategies were identified, denoted as a quantity of publication and a quality of publication strategy, and two strategies with respect to scientific collaboration were outlined, one focusing on multi-lateral and a second on bi-lateral collaborations. Our findings suggest that rankings of departments may be influenced by specific publication and management strategies, which in turn may depend upon the phase of development of the departments or their personnel structure. As a consequence, differences in rankings cannot be interpreted merely in terms of quality or significance of research. It is suggested that the problem of assigning papers resulting from multi-lateral collaboration to the contributing research groups has not yet been solved properly, and that more research is needed into the influence of a department’s state of development and personnel structure upon the values of bibliometric indicators. A possible implication at the science policy level is that different requirements should hold for departments of different age or personnel structure.

Keywords: Age, Authorship, Basic Research, Bibliometric, Bibliometric Indicators, Bibliometric Study, Bilateral, Biology, Biotechnology, Capacity, Collaboration, Development, Groups, Impact, Indicators, Management, Model, Molecular Biology, Molecular-Biology, Output, Participation, Performance, Performance Indicators, Policy, Productivity, Publication, Quality, Quantity, Rankings, Requirements, Research, Research Performance, Science, Science Policy, Science-Policy, Scientific Collaboration, Strategies, Strategy, Structure

? van Raan, A.F.J. (2000), On growth, ageing, and fractal differentiation of science. *Scientometrics*, **47** (2), 347-362.

Full Text: [2000\Scientometrics47, 347.pdf](2000/Scientometrics47,%20347.pdf)

Abstract: On the basis of the measured time-dependent distribution of references in recent scientific publications, we formulate a novel model on the ageing of recent scientific literature. The framework of this model is given by a basic set of mathematical expressions that allows us to understand and describe large-scale growth and ageing processes in science over a long period of time. In addition, a further and striking consequence results in a self- consistent way from our model. After the Scientific Revolution in 16th century Europe, the ‘Scientific Evolution’ begins, and the driving processes growth and ageing unavoidably lead - just as in our biological evolution - to a fractal differentiation of science. A fractal structure means a system build up with subsystems characterised by a power-law size distribution. Such a distribution implies that there is no preference of size or scale. Often this phenomenon is regarded as a fingerprint of self-organisation. These findings are in agreement with earlier empirical findings concerning the clustering of scientific literature. Our observations reinforce the idea of science as a complex, largely self-organising ‘cognitive eco-system’. They also refute Kuhn’s paradigm model of scientific development.

Keywords: Ageing, Clustering, Complex, Development, Differentiation, Distribution, Driving, Dynamics, Ecosystem, Europe, Evolution, Fingerprint, Fractal Structure, Growth, Law, Lead, Model, Models, Obsolescence, Preference, Publications, Recent, Scale, Science, Scientific Publications, Size, Size Distribution, Structure

? Rinia, E.J. (2000), Scientometric studies and their role in research policy of two research councils in the Netherlands. *Scientometrics*, **47** (2), 363-378.

Full Text: [2000\Scientometrics47, 363.pdf](2000/Scientometrics47,%20363.pdf)

Abstract: In the past 30 years various scientometric analyses have provided input data for research policy objectives of research institutions in the Netherlands. In this article we discuss several pioneering studies performed on behalf of the research councils for physics (FOM) and technical sciences (STW), which have played an important role in the early development of scientometrics in this country. The motives for these studies, the results and the influence on research policy are discussed. Relations to present themes in scientometric investigations are drawn.

Keywords: Development, Indicators, Institutions, Investigations, Motives, Policy, Research, Role, Sciences, Scientometrics

? Rousseau, R. and Smyers, M. (2000), Output-financing at LUC. *Scientometrics*, **47** (2), 379-387.

Full Text: [2000\Scientometrics47, 379.pdf](2000/Scientometrics47,%20379.pdf)

Abstract: LUC’s research council stimulates research by allocating a part of its funds based on results. The output-financing scheme is presented and its role in the university’s research policy is explained. It is shown how this works in practice. An important aspect is that not only articles in JCR-covered journals are included but also other publications. This scheme together with a full-scale scientometric study forms two important aspects (short term versus medium term) of the university’s research evaluation exercise. Its success is largely due to a general acceptance by the: scientists.

Keywords: Evaluation, Journals, Publications, Research, Research Performance, Scientometric

? Tijssen, R.J.W., Buter, R.K. and van Leeuwen, T.N. (2000), Technological relevance of science: An assessment of citation linkages between patents and research papers. *Scientometrics*, **47** (2), 389-412.

Full Text: [2000\Scientometrics47, 389.pdf](2000/Scientometrics47,%20389.pdf)

Abstract: Patent citations to the research literature offer a way for identifying and comparing contributions of scientific and technical knowledge to technological development. This case study applies this approach through a series of analyses of citations to Dutch research papers listed on Dutch-invented and foreign patents granted in the US during the years 1987-1996. First. we examined the general validity and utility of these data as input for quantitative analyses of science-technology interactions. The findings provide new empirical evidence in support of the general view that these citations reflect genuine links between science and technology. The results of the various analyses reveal several important features of industrially relevant Dutch science: (1) the international scientific impact of research papers that are also highly cited by patents, (2) the marked rise in citations to Dutch papers on foreign-invented patents, (3) the large share of author-inventor self-citations in Dutch-invented patents, (4) the growing relevance of the life sciences, (5) an increase in the importance of scientific co-operation. We also find significant differences between industrial sectors as well as major contributions of large science-based multinational enterprises, such as Philips, in domestic science-technology linkages. The paper concludes by discussing general benefits and limitations of this bibliometric approach for macro-level analysis of science bases in advanced industrialised countries like the Netherlands.

Keywords: Academic Research, Analysis, Assessment, Bibliometric, Case Study, Citation, Citations, Development, Enterprises, Features, General, Impact, Importance, Indicators, Industrial, Industrial-Innovation, Interactions, Interface, Knowledge, Life, Limitations, Paper, Patents, Research, Science, Sciences, Statistics, Support, US, Utility, Validity

Torricella-Morales, R.G., Van Hooydonk, G. and Araujo-Ruiz, J.A. (2000), Citation analysis of Cuban research. Part 1. A case study: The Cuban Journal of Agricultural Science. *Scientometrics*, **47** (2), 413-426.

Full Text: [S\Scientometrics47, 413.pdf](S/Scientometrics47,%20413.pdf)

Abstract: Bibliometric analyses of research in developing countries are interesting for various reasons. The situation of Cuba is rather exceptional. The Cuban Journal of Agricultural Science (CJAS) is the only Cuban research journal, indexed by the Institute of Scientific information’s Web of Science (WoS). We explore the possibilities of a citation analysis for Cuban research publications in general and for those in CJAS in particular. For the period 1988-1999, we find that this journal represents 14% of Cuban research publications. cited in the WoS. We remark that the number of self citations is relatively high and even increases since 1995, The results are classified by disciplines and we use a co-citation matrix to discuss the different observed citation patterns

Keywords: Citation, Citations, Countries, Impact Factors, Latin-America, Publication, Research, Retrieval, Scientists, Scientometrics, Strategies

? Verspagen, B. (2000), The role of large multinationals in the Dutch technology infrastructure. A patent citation analysis. *Scientometrics*, **47** (2), 427-448.

Full Text: [2000\Scientometrics47, 427.pdf](2000/Scientometrics47,%20427.pdf)

Abstract: This paper investigates the impact of large multinational firms on the Dutch technology infrastructure. More specifically, it asks how the structure of the knowledge flows network matters for diffusion of technological knowledge in the Dutch economy. Patent citation analysis based on European Patent applications is used to quantify this network. The paper finds that there are large differences between firms in terms of the density of their ‘ego-network’, and the amount of knowledge spillovers to the Dutch economy that they generate.

Keywords: Analysis, Applications, Citation, Citation Analysis, Density, Diffusion, Economy, Enterprises, Flows, Impact, Knowledge, Paper, Research-and-Development, Role, Spillovers, Structure

? Moed, H.F. (2000), Speech delivered at the 7th International Conference on Scientometric and Informetrics in Colima (1999) in the honour of Dr. Cornelius Le Pair on the occasion of his retirement. *Scientometrics*, **47** (2), 449-450.

Full Text: [2000\Scientometrics47, 449.pdf](2000/Scientometrics47,%20449.pdf)

Okubo, Y. (2000), An introduction to scientometrics research in France. *Scientometrics*, **47** (3), 451-455.

Full Text: [2000\Scientometrics47, 451.pdf](2000/Scientometrics47,%20451.pdf)

Keywords: France, Research, Scientometrics

Arvanitis, R., Waast, R. and Gaillard, J. (2000), Science in Africa: A bibliometric panorama using PASCAL database. *Scientometrics*, **47** (3), 457-473.

Full Text: [2000\Scientometrics47, 457.pdf](2000/Scientometrics47,%20457.pdf)

Abstract: PASCAL, whose troublesome artefacts we highlight, also has its strong points (multidisciplinarity, codification of the topic of each article, better coverage of some countries). As other sources, it shows that the current decade is one of crisis in African research. However, developments are highly contrasted, depending on the discipline and the regions. To the north of Africa, the Maghreb is witnessing an unprecedented gain in power. Nigerian science is in quite the contrary situation, imploding. In the rest of Africa, classification of countries brings to evidence very striking changes in order. Basic science declines. The Agricultural and the Medical sciences are stagnating. Conversely, the Engineering sciences are growing, in particular to the North of the Sahara.

Keywords: Africa, Bibliometric, Classification, Crisis, Current, Order, Research, Science, Sciences, Sources

? Dore, J.C., Dutheuil, C. and Miquel, J.F. (2000), Multidimensional analysis of trends in patent activity. *Scientometrics*, **47** (3), 475-492.

Full Text: [2000\Scientometrics47, 475.pdf](2000/Scientometrics47,%20475.pdf)

Abstract: Only multidimensional analyses can provide overviews of complex relationships among many variables. We have previously illustrated the use of Correspondence Factor Analysis (CFA) in the analysis of publication profiles. In this article, we retrace our activity in patent analysis from the late 1970s to the present day and show how CFA is a particularly useful tool not only for describing the correlations between countries and technological Fields but also for highlighting non-linear patenting time trends.

Keywords: Activity, Analysis, Citation Analysis, Complex, Correlations, Countries, Indicators, Information, Non-Linear, Nonlinear, Patent Analysis, Profiles, Publication, Science, Statistics, Technology, Time Trends, Trends

? Gusmao, R. (2000), Developing and using indicators of multilateral S&T cooperation for policy making: The experience from European research programmes. *Scientometrics*, **47** (3), 493-514.

Full Text: [2000\Scientometrics47, 493.pdf](2000/Scientometrics47,%20493.pdf)

Abstract: As European Union research programmes play an increasingly important role within the research and innovation systems of Member States, the need for appropriate indicators to grasp and analyze this collaborative phenomenon has in recent years become obvious. Such indicators are becoming essential decision-making tools for science policy makers at the national level. EU science policy responds to not one but a number of objectives, while one country or one laboratory’s participation in European S&T cooperation is likely to manifest a number of particularities, and be quite different from another’s. Such a complex system makes it possible to elaborate a large variety of indicators. This article proposes several possible types of indicators and shows how they could be useful for weighing research policy strategies at the national and European levels.

Keywords: Complex, Decision Making, Decision-Making, EU, European Union, Indicators, Innovation, Levels, Participation, Policy, Policy Making, Policy-Making, Recent, Research, Role, Science, Science Policy, Science-Policy, Strategies, Tools

? Laredo, P. and Mustar, P. (2000), Laboratory activity profiles: An exploratory approach. *Scientometrics*, **47** (3), 515-539.

Full Text: [2000\Scientometrics47, 515.pdf](2000/Scientometrics47,%20515.pdf)

Abstract: This article proposes a method for characterizing the ‘activity profiles’ of research laboratories. It is based on the ‘research compass card model’ derived from the sociology of science, and which highlights the five complementary contexts in which research activities develop. A test was conducted in a regional setting on 75 labs. It demonstrates that simple indicators are enough to measure levels of involvement in each activity. Seven ‘activity profiles’ based upon the mix by labs of their marked involvement were identified, crossing both institutional and disciplinary barriers.

Keywords: Activity, Barriers, Crossing, Indicators, Levels, Profiles, Regional, Research, Science, Sociology of Science, Test

? Lemarie, S., de Looze, M.A. and Mangematin, V. (2000), Strategies of European SMEs in biotechnology: The role of size, technology and market. *Scientometrics*, **47** (3), 541-560.

Full Text: [2000\Scientometrics47, 541.pdf](2000/Scientometrics47,%20541.pdf)

Abstract: Both the technological and market focus of 228 European biotechnology SMEs are analysed in this paper. Data from the Genetic Engineering catalogue provide a complementary representation compared to the patent publications that are most commonly used. Results of the analysis produce a new view of the development of biotech SMEs. First, no pattern of specialisation by country is observed, even though three types of company with different technological focus can be distinguished in the sample. Second, it is argued that the rapid technological evolution in this domain can hardly be explained by a rapid evolution of the technological basis of the companies, and should consequently be explained primarily by the creation of new SMEs. Third, four different patterns of linkage between technology and market focus are observed, by means of co-word analysis.

Keywords: Analysis, Biotechnology, Co-Word Analysis, Creation, Development, Evolution, Innovation, Paper, Patterns, Publications, Representation, Role, Size, Technological Evolution

Salaun, J.M., Lafouge, T. and Boukacem, C. (2000), Demand for scientific articles and citations: An example from the Institut de l’information scientifique et technique (France). *Scientometrics*, **47** (3), 561-588.

Full Text: [2000\Scientometrics47, 561.pdf](2000/Scientometrics47,%20561.pdf)

Abstract: The patterns that appear in exchanges between researchers, scientific journal publications and the demand for scientific articles often intersect, but the logic behind each type of activity is not necessarily the same. Analyses of requests for scientific articles from document suppliers may help to interpret current developments in electronic publishing. This study of article requests to the Institut de I’information scientifique et technique (INIST) shows that, in France, document supply customers fall into three main categories: business, academic libraries and public research organisations, in descending order. Demand focuses mainly on medicine, pharmacology, biology and chemistry, and the distribution of articles is entirely in accordance with the laws of bibliometrics. A further comparative analysis shows a high reciprocal correlation (except in the physical sciences) between the 50 journals most Frequently requested from INIST, and the 50 most frequently cited journals according to ISI (Institute for Scientific Information). The titles which did not appear in either one list or the other show that the most frequently cited physics journals are not necessarily requested from the document supplier, and that, conversely, some frequently requested journals are not often cited. It may therefore be assumed that a trade in electronic articles is likely to develop quite rapidly in disciplines which are common to both lists, although this would focus on reputed titles only, but that a different pattern of electronic document exchange would emerge for scientific literature in other disciplines.

Keywords: Academic, Activity, Analysis, Bibliometrics, Biology, Citations, Comparative Analysis, Correlation, Current, Distribution, Fall, France, Institute for Scientific Information, ISI, Journal, Libraries, Order, Pharmacology, Physical, Publications, Publishing, Research, Sciences, Serials, Stationary Scientometric Distributions

Sigogneau, A. (2000), An analysis of document types published in journals related to physics: Proceeding papers recorded in the Science Citation Index database. *Scientometrics*, **47** (3), 589-604.

Full Text: [2000\Scientometrics47, 589.pdf](2000/Scientometrics47,%20589.pdf)

Abstract: The introduction of bibliometric indicators to compare the scientific performance of countries soon raised questions about what document types should be counted for comparison. The present study deals with the development of different document types published in journals related to Physics and recorded in the Science Citation Index. We first take a look at the evolution of the production and citation of papers by document type as well as at the specialization of countries in different document types. We then highlight some characteristics of the ISI document type category ‘Proceedings’ followed by an analysis of publishers and average number of ‘Proceedings’ pages.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Characteristics, Citation, Comparison, Development, Evolution, Indicators, ISI, Performance, Production, Science Citation Index

? Solari, A. and Magri, M.H. (2000), A new approach to the SCI *Journal Citation Reports*, a system for evaluating scientific journals. *Scientometrics*, **47** (3), 605-625.

Full Text: [2000\Scientometrics47, 605.pdf](2000/Scientometrics47,%20605.pdf)

Abstract: The Science Citation Index, Journal Citation Reports (JCR), published by the Institute for Scientific Information (ISI) and designed to rank, evaluate, categorize and compare journals, is used in a wide scientific context as a tool for evaluating researchers and research work, through the use of just one of its indicators, the impact factor. With the aim of obtaining an overall and synthetic perspective of impact factor values, we studied the frequency distributions of this indicator using the box-plot method. Using this method we divided the journals listed in the JCR into five groups (low, lower central, upper central, high and extreme). These groups position the journal in relation to its competitors. Thus, the group designated as extreme contains the journals with high impact factors which are deemed to be prestigious by the scientific community. We used the JCR data from 1996 to determine these groups, firstly for all subject categories combined (all 4779 journals) and then for each of the 183 ISI subject categories. We then substituted the indicator value for each journal by the name of the group in which it was classified. The journal group may differ from one subject category to another. In this article, we present a guide for evaluating journals constructed as described above. It provides a comprehensive and synthetic view of two of the most used sections of the JCR, It makes it possible to make more accurate and complete judgements on and through the journals, and avoids an oversimplified view of the complex reality of the world of journals. It immediately reveals the scientific subject category where the journal is best positioned. Also, whereas it used to be difficult to make intra- and interdisciplinary comparisons, this is now possible without having to consult the different sections of the JCR. We construct this guide each year using indicators published in the JCR by the ISI.

Keywords: Community, Complex, Distributions, Group, Groups, Impact, Impact Factor, Impact Factors, Indicator, Indicators, Institute for Scientific Information, Interdisciplinary, ISI, Journal, Journal Citation Reports, Low, Position, Rank, Research, Research Work, SCI, Science Citation Index, Synthetic, Upper

? Zitt, M., Bassecoulard, E. and Okubo, Y. (2000), Shadows of the past in international cooperation: Collaboration profiles of the top five producers of science. *Scientometrics*, **47** (3), 627-657.

Full Text: [2000\Scientometrics47, 627.pdf](2000/Scientometrics47,%20627.pdf)

Abstract: This article aims at a characterization of the cooperation behavior among five large scientific countries (France, Germany, Japan, United Kingdom and United States of America) from 1986 to 1996. It looks at the cooperation profiles of these countries using classical measures such as the Probabilistic Affinity. The results show the major influence which historical, cultural and linguistic proximities may have on patterns of cooperation, with few changes over the period of time studied. A lack of specific affinities among the three largest European countries is revealed, and this contrasts with the strong linkage demonstrated between United States and Japan. The ensuing discussion raises some questions as to the process of Europeanization in science. The intensity of bilateral cooperation linkages is then studied with regard to field specialization by country, and this analysis yields no general patterns at the scale studied. Specific bilateral behaviors are also analyzed.

Keywords: Analysis, Authorship, Behavior, Bilateral, Characterization, Countries, France, General, Germany, Historical, Intensity, Japan, Link Indicator, Process, Profiles, Scale, Science, Scientific Collaboration, United Kingdom, United States

Anduckia, J.C., Gomez, J. and Gomez, Y.J. (2000), Bibliometric output from Colombian researchers with approved projects by COLCIENCIAS between 1983 and 1994. *Scientometrics*, **48** (1), 3-25.

Full Text: [2000\Scientometrics48, 3.pdf](2000/Scientometrics48,%203.pdf)

Abstract: We present a characterization of bibliometric output in Colombia resulting from research projects financed by COLCIENCIAS between 1983 and 1994 in the following programs: Health Sciences, Basic Science, Energy and Mining, Agricultural Sciences, Technological, Industrial and Quality Development, Marine Sciences, Social Sciences, Education, Environment and Habitat, Electronics, Telecommunications and Information Systems. In the case of periodicals, we establish: patterns of production by author, patterns of publication in national journals vs. international journals, the effect of international collaboration in projects over publication in international journals, patterns of bibliometric production by fields of research using UNESCO classifications, a list of the most frequently used journals by Colombian researchers as vehicles to communicate their results, patterns of bibliometric production from Colombian institutions, geographical distribution of bibliometric output, and finally, a review on the mean number of authors of articles for some fields of science and technology. We present also theses production patterns for books and B.Sc., MSc. and PhD. theses using UNESCO codes of the projects. We comment on the human resources formation. It is found as a dominant behavior of the so commented patterns a low index of publication per project and a high tendency in the distribution of publications to concentrate on few actors (researchers, institutions, origin of the publication, journals, human resources). It is also found that there exists a strong concentration of bibliometric output in the program of Basic Sciences, in fields such as phytochemistry and solid state physics (super and semiconductors).

Keywords: Behavior, Bibliometric, Characterization, Collaboration, Colombia, Concentration, Countries, Distribution, Formation, Human, Index, Institutions, International Collaboration, Latin-America, Low, Output, Periodical Publications, Periodicals, Production, Program, Publication, Publications, Research, Research Projects, Review, Science

Prasad, A. and Visalakshi, S. (2000), Trends and profile in enzyme engineering research during 1971-98. *Scientometrics*, **48** (1), 27-44.

Full Text: [S\Scientometrics48, 27.pdf](S/Scientometrics48,%2027.pdf)

Abstract: There is sufficient evidence to prove the potential of immobilized enzymes to be commercially successful in many industries, but a survey of products in biotechnology and some reports indicate its limited success. To visualize the factual status, the present study looks into trends and profiles of this field using scientometric methods. The salient results show a steady decline in outputs in the form of patents and publications since 1993 along with a decline in the number of groups from academics and industries. Among the countries involved, there is also a decline, though USA and Japan show some strength in basic and applied research, respectively.

Keywords: Biotechnology, Engineering, Enzyme, Enzymes, Groups, Immobilized, Indicators, Japan, Laser Research, Methods, Patents, Products, Profile, Profiles, Publications, Research, Science, Strength, Survey, Trends, USA

? Nanda, S.K., Rivas, A.L., Trochim, W.M. and Deshler, J.D. (2000), Emphasis on validation in research: A meta-analysis. *Scientometrics*, **48** (1), 45-64.

Full Text: [2000\Scientometrics48, 45.pdf](2000/Scientometrics48,%2045.pdf)

Abstract: The emphasis of validity as a publication content was investigated in dissertations and journal articles. The time of first publication, longitudinal publication profile, ratio of articles to dissertations, and time lag between dissertations and articles emphasizing validity were compared within and among various fields. A three-decade gap separated the first field adopting validity-related contents in its dissertations from the latest fields that did so. The longitudinal data suggested three groups of fields (Agricultural Sciences, Applied Sciences and Social Sciences) which showed consistent differences among groups and consistent similarities within groups in their emphasis on validity-related content. Adoption of validity-related content in dissertations always preceded adoption of validity-related content in journal articles. On average, less than 4% of journal articles included validity-related content across fields. These findings support the hypothesis that validity has been introduced and disseminated within fields following patterns predicted by diffusion of innovations theory. It is argued that this pattern is inconsistent with an efficient and interdisciplinary utilization of available knowledge. Policy recommendations are made for developing strategic communication and education programs for academicians and journal reviewers.

Keywords: Communication, Diffusion, Education, Groups, Interdisciplinary, Journal, Knowledge, Longitudinal, Made, Meta-Analysis, Profile, Publication, Recommendations, Research, Support, Theory, Time Lag, Time-Lag, Utilization, Validation, Validity

Abt, H.A. (2000), Do important papers produce high citation counts? *Scientometrics*, **48** (1), 65-70.

Full Text: [S\Scientometrics48, 65.pdf](S/Scientometrics48,%2065.pdf)

Abstract: In honor of the centennial of the American Astronomical Society, we asked 53 senior astronomers to select what they thought were the most important papers published in the Astronomical Journal or Astrophysical Journal during this century. This selection of important papers gives us the opportunity to determine whether important papers invariably produce high citation counts. We compared those papers with control papers that appeared immediately before and after the important papers. We found that the important papers published before 1950 produced 11 times as many citations on the average as the controls and after 1950, 5.1 times as many citations. Of the important papers, 92% produced more citations than the average for the control papers. Therefore important papers almost invariably produce many more citations than others, and citation counts are good measures of importance or usefulness. An appraisal of the 53 papers is that three are primarily useful collections of data or descriptions, 46 are fundamental studies giving important results, and four are both useful and fundamental. The lifetimes of all 53 important papers average 2.5 times longer than for the controls. The ages of the authors of these important papers ranged from 23 to 70, with a mean of 39±11 years, indicating that astronomers can write important papers at any age.

Keywords: Age, Citation, Citations, Control, Importance, Selection

Tonta, Y. (2000), Contribution of Turkish researchers to the world’s biomedical literature (1988-1997). *Scientometrics*, **48** (1), 71-84.

Full Text: [S\Scientometrics48, 71.pdf](S/Scientometrics48,%2071.pdf)

Abstract: The contribution of Turkish researchers to positive sciences is increasing. Turkish scientists published more than 5100 articles in 1998 in scientific journals indexed by the Institute for Scientific Information’s Science Citation Index, which elevated Turkey to the 25(th) place in the world rankings in terms of total contribution to science. In this paper, we report the preliminary findings of the bibliometric characteristics (authors and affiliations, medical journals and their impact factors, among others) of a total of 8442 articles published between 1988 and 1997 by scientists affiliated with Turkish institutions and indexed in the MEDLINE database.

Keywords: Bibliometric, Characteristics, Impact, Impact Factors, Institutions, Medical, Medical Journals, Medline, Paper, Rankings, Science, Science Citation Index, Sciences, Turkey

Eto, H. (2000), Bibliometric distance between methodology and application in statistics. *Scientometrics*, **48** (1), 85-97.

Full Text: [S\Scientometrics48, 85.pdf](S/Scientometrics48,%2085.pdf)

Abstract: This paper analyses communications between statistical methodology and applied statistics in terms of the similarity and dissimilarity in their authorship and citation patterns, and further the communication distance between them in terms of mutual citation and the time lag therein. Hypotheses are presented on their difference and distance and are verified for data from the Journal of the Royal Statistical Society, the oldest statistical society in the world. The data analysis reveals that they are indeed different and distant each other to a certain extent but less distinctly than initially conjectured in the hypotheses

Keywords: Analysis, Authorship, Citation, Communication, Dissimilarity, Methodology, Paper, Similarity, Statistics, Time Lag, Time-Lag

Lee, M., Om, K. and Koh, J. (2000), The bias of sighted reviewers in research proposal evaluation: A comparative analysis of blind and open review in Korea. *Scientometrics*, **48** (1), 99-116.

Full Text: [S\Scientometrics48, 99.pdf](S/Scientometrics48,%2099.pdf)

Abstract: This article compares empirically the major factors affecting blinded and sighted reviewers in the selection of research proposals to be funded in a ‘scientifically small’ country. Fisher’s Z-test shows that the applicant characteristics (rank of undergraduate school where the applicant studied, professional age of the applicant, and academic recognition of the applicant) are the major factors leading to the significantly different evaluation scores between blinded and sighted reviewers. This means that ‘open’ evaluation of research proposals is obviously biased. Policy implications of the findings and future research directions are discussed.

Keywords: Academic, Age, Analysis, Bias, Characteristics, Comparative Analysis, Evaluation, Korea, Peer, Rank, Research, Review, School, Selection, Undergraduate

? Wormell, I. (2000), Proceedings of the 4th Nordic Workshop in Bibliometrics Copenhagen (Denmark), August 27-28, 1999 - Foreword. *Scientometrics*, **48** (2), 117-120.

Full Text: [2000\Scientometrics48, 117.pdf](2000/Scientometrics48,%20117.pdf)

Keywords: Denmark

? Glänzel, W. (2000), Science in Scandinavia: A bibliometric approach. *Scientometrics*, **48** (2), 121-150.

Full Text: [2000\Scientometrics48, 121.pdf](2000/Scientometrics48,%20121.pdf)

Abstract: The development of publication activity and citation impact in Scandinavian countries is studied for the 1980-1997 period. Besides the analysis of trends in publication and citation patterns and of national publication profiles, an attempt is made to find statistical evidences of the relation between international co-authorship and both research profile and citation impact in the Nordic countries. A coherent Scandinavian cluster has been found, and the Nordic countries have strong co-authorship links with highly developed countries in West Europe and North America. It was found that international co-authorship, in general, results in publications with higher citation rates than purely domestic papers. International collaboration has, however, not the same influence on publication profiles and citation impact of each analysed countries.

Keywords: Activity, Analysis, Bibliometric, Citation, Cluster, Co-Authorship, Collaboration, Development, Europe, General, Impact, Indicators, Made, North America, Profile, Profiles, Publication, Publications, Research, Trends

? Meyer, M. (2000), Patent citations in a novel field of technology - What can they tell about interactions between emerging communities of science and technology? *Scientometrics*, **48** (2), 151-178.

Full Text: [2000\Scientometrics48, 151.pdf](2000/Scientometrics48,%20151.pdf)

Abstract: This paper aims to contribute to a better understanding of patent citation analysis in general and its application to novel fields of science and technology in particular. It introduces into the subject-matter by discussing an empirical problem, the relationship of nano-publications and nano-patents as representations of nano-science and nano-technology. Drawing on a variety of sources, different interpretations of patent citations are presented. Then, the nature of patent citations is further investigated by comparing them to citations in the scientific literature. After characterizing the citation linkage as indicators of reciprocal relationships between science and technology, patent citations in nano-science and technology are analyzed in terms of interfield and organizational knowledge-flows.

Keywords: Analysis, Citation, Citation Analysis, Citations, Communities, General, Indicators, Interactions, Nanotechnology, Organizational, Paper, Patent Citations, Science, Sources

? Sandstrom, A., Pettersson, I. and Nilsson, A. (2000), Knowledge production and knowledge flows in the Swedish biotechnology innovation system. *Scientometrics*, **48** (2), 179-201.

Full Text: [2000\Scientometrics48, 179.pdf](2000/Scientometrics48,%20179.pdf)

Abstract: As a basis for policy decisions, governments are increasingly using analysis of systems of innovation. Fundamental to the systems of innovation approach is the recognition that innovation processes essentially are interactive activities. The present paper illustrates the use and limitations of bibliometries in analysing the knowledge production and knowledge flows in a section of an innovation system focusing on life science subject fields relevant to innovation processes in biotechnology. Bibliometrics can in this context be used to identify the actors in a research intensive innovation system, the scientific profiles of actors as well as identifying networks and collaboration patterns.

Keywords: Analysis, Biotechnology, Collaboration, Combined Cocitation, Flows, Innovation, Interactive, Knowledge, Life, Limitations, Paper, Policy, Policy Decisions, Production, Profiles, Research, Science, Word Analysis

Wormell, I. (2000), Bibliometric analysis of the welfare topic. *Scientometrics*, **48** (2), 203-236.

Full Text: [2000\Scientometrics48, 203.pdf](2000/Scientometrics48,%20203.pdf)

Abstract: The article is reporting the results of the first part of an extensive informetric analysis of the Welfare topic, carried out in 1998–1999. The aim was to analyse the structure of the literature of international Welfare research, to provide a detailed picture of its basic theoretical and empirical concepts and the mutual relations existing between these concepts.

The approach is novel in that through the application of quantitative (i.e., bibliometric) techniques it tries to reduce subjectivity in domain analysis and in the mapping of the developments and segmentation in special topical areas.

The analysis used the technique of co-ordinated online searches in a cluster of international bibliographic databases in DIALOG. The identified 13 sub-topics have been in detail analysed, in three time intervals. By measuring trends and developments in the number of publications, term occurrences, similarity between the subject terms and formation of clusters among the subject segments the analysis provides a comprehensive review of such a complex research field as the Welfare State is. The study, which primary aim is to improve the methodology of quantitative analysis in the so called ‘soft’ sciences, will increase the interest among social scientists, scholars of the humanities and library and information science to use databases as analytical tools and to apply the modern text mining techniques for the extraction of knowledge from bibliographic data.

Keywords: Analysis, Analytical Tools, Bibliographic Databases, Bibliometric, Cluster, Clusters, Complex, Databases, Domain Analysis, Extraction, Formation, Information, Information Science, Knowledge, Library And Information Science, Mapping, Methodology, Mining, Publications, Quantitative Analysis, Reporting, Research, Review, Science, Sciences, Segmentation, Similarity, Social, Structure, Techniques, Tools, Trends

? Wormell, I. (2000), Critical aspects of the Danish Welfare State - as revealed by issue tracking. *Scientometrics*, **48** (2), 237-250.

Full Text: [2000\Scientometrics48, 237.pdf](2000/Scientometrics48,%20237.pdf)

Abstract: The paper examines the applicability of informetric methods to trace the pattern of debate about the three main critical issues of the modem Welfare State in Denmark: economic aspects, legitimacy and functionality. The methodology of issue tracking is used to follow the developments of these issues in periods through national databases of various types covering information about the research, implementation, press and legislation aspects. The approach taken is novel in that it implements and tests issue tracking in this area of social sciences, and tries to reduce subjectivity in the analysis of trends influencing social policy and public opinion. The study aims to show how the emerging data and text mining techniques can be applied to integrate downloaded bibliographic data with other types of information in a strategic mix.

Keywords: Analysis, Databases, Denmark, Economic, Implementation, Information, Methodology, Methods, Mining, Paper, Policy, Research, Sciences, Social, Social Sciences, Techniques, Tests, Tracking, Trends

Schubert, A. (2000), Scientometrics in medicine-related fields 1990–1999. *Scientometrics*, **48** (2), 251-284.

Full Text: [S\Scientometrics48, 251.pdf](S/Scientometrics48,%20251.pdf)

Anduckia, J.C., Gomez, J. and Gomez, Y.J. (2000), Some features of Colombian research population (1983-1994). *Scientometrics*, **48** (3), 285-305.

Full Text: [2000\Scientometrics48, 285.pdf](2000/Scientometrics48,%20285.pdf)

Abstract: We present some features that characterise the mobility and interaction of researchers within a given S&T environment. The variable of interest is the number of research proposals submitted for funding. The model is applied to the case of Colombia and the following results are exhibited: a) a ‘flux matrix’ that characterises the ‘interactions’ as a function of rime between researchers and COLCIENCIAS (national S&T funding agency). Some properties of the matrix are established and a ‘probability’ for a researcher who has previously submitted a proposal to reenter is calculated as a function of time. It is found that this probability is approximately time-independent, at least for the next 7 years after first researcher’s appearance, b) patterns of interaction between researchers/institutions and COLCIENCIAS, seen through the number of presented proposals. The interaction assumes the will-known form encountered in these kinds of distributions: a small set of actors (researchers/institutions) is responsible for most of the interaction, c) a temporal pattern for mean researcher’s age is established and it is found that by the end of the observed period researchers start to interact in ages that are significantly greater than those observed at the beginning.

Keywords: Age, Appearance, Colombia, Distributions, Environment, Features, Function, Funding, Interaction, Mobility, Model, Population, Probability, Properties, Research, Temporal

? Saetnan, A.R. (2000), To screen or not to screen? Science discourse in two health policy controversies, as seen through three approaches to the citation evidence. *Scientometrics*, **48** (3), 307-344.

Full Text: [2000\Scientometrics48, 307.pdf](2000/Scientometrics48,%20307.pdf)

Abstract: This article is an empirical study of two science and health policy controversies - ‘to screen or not to screen’ with ultrasound in pregnancy and with mammography for breast cancer. In each case, conflicting experimental results have been published. Which of the results have been accepted within the medical science community? The article is also a theoretical and methodological study of three views of science - an institutional view, an interests view, and a semiotic view. How might each approach scientific publications as evidence? Could they be eclectically combined in a more complex view of science discourse?

Keywords: Breast Cancer, Breast-Cancer Detection, Cancer, Citation, Community, Complex, Controlled Trial, Death Rates, Experimental, Health, Health Policy, Mammography, Medical, Mortality, Policy, Pregnancy, Prenatal Ultrasound, Publications, Randomized Trial, Routine, Science, Scientific Publications, Ultrasound, Women

Egghe, L. (2000), A heuristic study of the first-citation distribution. *Scientometrics*, **48** (3), 345-359.

Full Text: [2000\Scientometrics48, 345.pdf](2000/Scientometrics48,%20345.pdf)

Abstract: The first-citation distribution, i.e. the cumulative distribution of the time period between publication of an article and the time it receives its first citation, has never been modelled by using well-known informetric distributions. An attempt to this is given in this paper. For the diachronous aging distribution we use a simple decreasing exponential model. For the distribution of the total number of received citations we use a classical Lotka function. The combination of these two tools yield new first-citation distributions.

The model is then tested by applying nonlinear regression techniques. The obtained fits are very good and comparable with older experimental results of Rousseau and of Gupta and Rousseau. However our single model is capable of fitting all first-citation graphs, concave as well as S-shaped, in the older results one needed two different models for it.

Our model is the function

(t1)=(1at1)1

Here γ is the fraction of the papers that eventually get cited, t1 is the time of the first citation, a is the aging rate and α is Lotka’s exponent. The combination of a and α in one formula is, to the best of our knowledge, new. The model hence provides estimates for these two important parameters.

Keywords: Aging, Bean, Citation, Citations, Distribution, Distributions, Experimental, Fitting, Fraction, Function, Knowledge, Model, Models, Nonlinear, Nonlinear Regression, Older, Paper, Parameters, Publication, Regression, Techniques, Tools, Yield

? Zelman, A. and Leydesdorff, L. (2000), Threaded email messages in Self-Organization and Science & Technology Studies oriented mailing lists. *Scientometrics*, **48** (3), 361-380.

Full Text: [2000\Scientometrics48, 361.pdf](2000/Scientometrics48,%20361.pdf)

Abstract: The paper addresses the potential of Internet mailing lists to enhance academic research with respect to Gibbons’ distinction between Mode I and Mode II knowledge production (Gibbons et al., 1994). We examine threaded email messages in a selection of Self-Organization and Science & Technology Studies oriented Internet mailing lists to illustrate the internal dynamics involved in the electronic production of knowledge. Of particular interest is the EuroCon-Knowflow mailing list which houses the electronic communication of the Self-Organization of the European Information Society (SOEIS) research group. The research focuses upon the discussion threads of mailing lists. The use of threaded messages as our hermeneutic units of analysis provides the basis for a reflection upon three key theoretical positions: Medium Theory, Actor-Network Theory, and Self-Organization Theory. With respect to the latter, we measure for self-organized criticality by comparing the frequency and size of threaded messages. Using this and other methods as operationalized modes of theorizing we reveal network dynamics particular to the Internet mailing list.

Keywords: Academic, Analysis, Communication, Dynamics, Group, Internet, Key, Knowledge, Methods, Paper, Production, Research, Selection, Size

Basu, A. and Kumar, B.S.V. (2000), International collaboration in Indian scientific papers. *Scientometrics*, **48** (3), 381-402.

Full Text: [2000\Scientometrics48, 381.pdf](2000/Scientometrics48,%20381.pdf)

Abstract: Internationally co-authored publications may be regarded as an indicator of scientific co-operation between countries and is of interest in science policy. In this study, the extent of international collaboration in Indian science has been estimated from SCI data in 1990 and 1994. We find an increase in collaboration both in terms of output and the extent of the network and significantly higher impact (IF) associated with internationally co-authored papers in several disciplines. However, there was no significant increase in IF of collaborative papers over time, whereas Indian papers in general showed a statistically significant, though small, increase in average impact from 1990 to 1994. The bulk of Indian scientific co-operation was with the developed Western nations and Japan, but it was often the smaller countries with a few co-authored papers which showed higher average impact. Co-operation with South Asian countries, initially low, has doubled in four years. By a combination of multivariate data analysis techniques the relative positions of India’s partners in scientific collaboration have been mapped with respect to the fields of co-operation.

Keywords: Analysis, Asian, Bean, Collaboration, General, Impact, Indicator, International Collaboration, Japan, Low, Multivariate, Output, Policy, Publications, SCI, Science, Science Policy, Science-Policy, Scientific Collaboration, Techniques

? Trimble, V. (2000), Some characteristics of young vs. established American astronomers: Entering the new century. *Scientometrics*, **48** (3), 403-411.

Full Text: [2000\Scientometrics48, 403.pdf](2000/Scientometrics48,%20403.pdf)

Abstract: A third cohort of(mostly) young astronomers, who earned their PhDs around a median date of 1994 and who have recently applied for election to membership in the International Astronomical Union from the USA or for tenure-track faculty positions has been added to earlier samples (median years of PhD 1982 and 1962.5), and the samples examined for demographic trends. The three groups are of similar size (304, 269, and 268 astronomers from earliest to latest). The third, youngest, cohort includes more foreign-born and/or trained scientists than either of the earlier ones (about 1/2 vs. about 1/4) and more women (about 15% vs. about 10% For the two earlier groups). The median length of time From BS or BS to PhD, which had lengthened from 4 to 6 years, has apparently leveled off at 6 years. And, compared to the previous ‘young’ sample, the present one includes many more job seekers and many fewer IAU aspirants.

Keywords: Characteristics, Cohort, Faculty, Groups, Size, Trends, Usa, Women

? Choung, J.Y. and Hwang, H.R. (2000), National systems of innovation: Institutional linkages and performances in the case of Korea and Taiwan. *Scientometrics*, **48** (3), 413-426.

Full Text: [2000\Scientometrics48, 413.pdf](2000/Scientometrics48,%20413.pdf)

Abstract: This paper focuses on the measurement of scientific and technological performance of Korea and Taiwan in what has been the most successful technology catch-up within developing economies context. The performance measures are based on the publication data for scientific knowledge production and patent data for technological capabilities. In addition, this analysis also reveals on the features of innovation system of these two countries, focusing on the linkages between public and private sector in the scientific and technological knowledge: creation. By examining the scientific and technological performance and the changing structure of innovation system, it provides empirical evidence on the positive interaction between scientific and technological activities.

Keywords: Analysis, Creation, Features, Innovation, Interaction, Knowledge, Korea, Measurement, Paper, Performance, Performance Measures, Production, Publication, Structure, Taiwan

Osareh, F. and Wilson, C.S. (2000), A comparison of Iranian scientific publications in the Science Citation Index: 1985–1989 and 1990–1994. *Scientometrics*, **48** (3), 427-442.

Full Text: [2000\Scientometrics48, 427.pdf](2000/Scientometrics48,%20427.pdf)

Abstract: Iranian scientific publications in the Science Citation Index for two five-year periods, 1985–1989 and 1990–1994, were compared. Distributions of various attributes of the publication output for the two periods were obtained primarily through the Rank command of the Dialog Online System. Results include: productivity by publication year and by ranked order of the most productive Iranian authors, influence or impact of the most productive Iranian authors by ranking them as cited authors, collaboration of Iranian scientists with scientists from other countries, and the journals Iranian scientists published in and the journals they cite in their papers. The subject areas of Iran’s scientific publications were examined vis-à-vis the world’s publication output and that of the Third World Countries (TWC).

Keywords: Collaboration, Comparison, Impact, Order, Output, Productivity, Publication, Publications, Ranking, Science Citation Index, Scientific Publications

? Kyvik, S. and Persson, O. (2000), Scientometric research in the Nordic countries - Introduction. *Scientometrics*, **49** (1), 3-6

Full Text: Scientometrics49, 3.pdf

Keywords: Research

Aksnes, D.W., Olsen, T.B. and Seglen, P.O. (2000), Validation of bibliometric indicators in the field of microbiology: A Norwegian case study. *Scientometrics*, **49** (1), 7-22.

Full Text: [2000\Scientometrics49, 7.pdf](2000/Scientometrics49,%207.pdf)

Abstract: This paper addresses two related issues regarding the validity of bibliometric indicators for the assessment of national performance within a particular scientific field. Firstly, the representativeness of a journal-based subject classification, and secondly, the completeness of the database coverage. Norwegian publishing in microbiology was chosen as a case, using the standard ISI-product National Science Indicators on Diskette (NSIOD) as a source database. By applying an ‘author-gated’ retrieval procedure, we found that only 41 percent of all publications in NSIOD-indexed journals, expert-classified as microbiology, were included under the NSIOD-category Microbiology. Thus, the set of defining core journals only is clearly not sufficient to delineate this complex biomedical field. Furthermore, a subclassification of the articles into different subdisciplines of microbiology revealed systematic differences with respect to representation in NSIOD’s Microbiology field, fish microbiology and medical microbiology are particularly underrepresented.

In a second step, the individual publication lists from a sample of Norwegian microbiologists were collected and compared with the publications by the same authors, retrieved bibliometrically. The results showed that a large majority (94%) of the international scientific production in Norwegian microbiology was covered by the database NSIOD. Thus, insufficient subfield delineation, and not lack of coverage, appeared to be the main methodological problem in the bibliometric analysis of microbiology.

Keywords: Analysis, Areas, Assessment, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Case Study, Classification, Complex, Core, Delimitation, Fish, Indicators, Medical, Microbiology, Paper, Performance, Physics, Production, Publication, Publications, Publishing, Representation, Science, Scientific Production, Source, Standard, Subfields, Validity

Danell, R. (2000), Stratification among journals in management research: A bibliometric study of interaction between European and American journals. *Scientometrics*, **49** (1), 23-38.

Full Text: [2000\Scientometrics49, 23.pdf](2000/Scientometrics49,%2023.pdf)

Abstract: Two key features of science are its rapid growth and its continuous differentiation. The establishment of new journals can be seen as an expression of both growth and differentiation. In this study of the network among management journals, the focus is on forms of differentiation, i.e., the relationship between stratification and specialization in a network of journals. The question asked in this study is whether the different position of American and European journals corresponds with different levels of specialization. A tendency toward such a structuration of the journal network would indicate an interregional integration of management research. Articles published in six of the most influential American and European journals covering the period from 1981 to 1998 have been downloaded. The findings in this study indicate that even though European journals formed a periphery in relation to the American journals in terms of clearly asymmetrical exchange relations, it was the European journals that seemed to be more comprehensive in scope. The tendency during the investigated period indicated differentiation in terms of segmentation rather than specialization

Keywords: Bibliometric, Bibliometric Study, Differentiation, Features, Growth, Integration, Interaction, Journal, Key, Levels, Management, Network, Position, Research, Science, Segmentation, Stratification, Structural-Equivalence

Ingwersen, P. (2000), The international visibility and citation impact of Scandinavian research articles in selected Social Science fields: The decay of a myth. *Scientometrics*, **49** (1), 39-61.

Full Text: [2000\Scientometrics49, 39.pdf](2000/Scientometrics49,%2039.pdf)

Abstract: The article covers the period 1989-1998. It investigates the results and meaningfulness of applying the Social Science Citation Index (SSCI, ISI, USA) to publication and citation studies of nine selected Social Science research areas in Scandinavia by analysing the international visibility, the research profiles, and relative citation impact. The study demonstrates that the areas Economics, Political Science, Sociology & Anthropology, Social Policy, Language & Linguistics, and, for Denmark and Finland, Information & Library Science as well as, for Sweden, Management studies, are well anchored internationally with a visibility in line with common S&T domains. The journal article world share of the region is increasing rapidly. Other small European countries, like the Netherlands, are even more substantially represented as regards citation analyses. The conclusion is that SSCI, although biased towards Angle-American publications, actually makes room for valid bibliometric and scientometric analyses of research published by Scandinavian and other smaller countries with English as the second language in journals regarded international by ISI.

Keywords: Bibliometric, Citation, Decay, Denmark, Finland, Impact, In-Line, ISI, Journal, Language, Profiles, Publication, Publications, Research, Research Articles, Science Citation Index, Second Language, Social Science Citation Index, Sweden, USA, Visibility

? Iversen, E.J. (2000), An excursion into the patent-bibliometrics of Norwegian patenting. *Scientometrics*, **49** (1), 63-80.

Full Text: [2000\Scientometrics49, 63.pdf](2000/Scientometrics49,%2063.pdf)

Abstract: This paper makes the assumption that Norwegian patenting in the US reflects a quasi-universe of Norwegian technological capabilities. Based on this assumption, the paper combines a ‘patent-bibliometrics’ and a ‘technometrics’ approach to study other relevant bodies of knowledge these capabilities build upon. In order to study interactions at the ‘science-technology-innovation interface’, the paper maps the citation patterns that radiate from the patent population (1990-96) to other areas of technology (patent-citations) and to science-bases (citations to Non-Patent Literature or NPL). The study identifies important technology-technology links that involve machinery, process-engineering and chemical and significant science-technology links that involve pharmaceuticals and instruments.

Keywords: Chemical, Citation, Citations, Interactions, Knowledge, Order, Paper, Patent Citations, Pharmaceuticals, Population, US

? Mahlck, P. and Persson, O. (2000), Socio-bibliometric mapping of intra-departmental networks. *Scientometrics*, **49** (1), 81-91.

Full Text: [2000\Scientometrics49, 81.pdf](2000/Scientometrics49,%2081.pdf)

Abstract: The mapping of author networks at academic departments is the focus of this study. Papers from two departments at two different universities, but within the same field of research, were analyzed in terms of co-authorship, direct and indirect citations among the authors. Considerable overlap was found between the co-authorship and the citation based networks. The paper also introduces the idea of socio-bibliometric maps that can be used to make social interpretations of bibliometric networks. The nodes of the networks were labeled by sex and seniority and supervisor-student links were also indicated. When reading the maps and tabulating the links it could be concluded that the two departmental networks were structured differently by sex and seniority.

Keywords: Academic, Bibliometric, Citation, Citations, Co-Authorship, Collaboration, Mapping, Paper, Research, Sex, Social, Universities

Meyer, M. (2000), What is special about patent citations? Differences between scientific and patent citations. *Scientometrics*, **49** (1), 93-123.

Full Text: [2000\Scientometrics49, 93.pdf](2000/Scientometrics49,%2093.pdf)

Abstract: The emergence of patent bibliometrics as a new branch of scientometrics necessitates a deeper understanding of the relationship between patents and papers. As this connection is established through the Linkage between patents and research papers, one must have a clear idea of similarities and differences between patent and paper citations. This paper will investigate to what extent one can not only apply bibliometric methods to patents but also extend the existing interpretative framework for citations in research papers to the field of patent citations. After pointing out some parallels in the debates about the nature of citations in patents and scientific articles, the paper outlines those parts of bibliometric theory covering scientific citations that could be relevant to patent citations too. Then it highlights the specialties and peculiarities of patent citations. One major conclusion is that the general nature of a common framework for both scientific and patent citations would severely limit its usefulness, but research on academic citations might still be a great source of inspiration to the study of patent citations.

Keywords: Academic, Bibliometric, Bibliometric Methods, Bibliometrics, Citations, Emergence, General, Methods, Paper, Patent Citations, Patents, Research, Scientometrics, Source, Theory

Seglen, P.O. and Aksnes, D.W. (2000), Scientific productivity and group size: A bibliometric analysis of Norwegian microbiological research. *Scientometrics*, **49** (1), 125-143.

Full Text: [2000\Scientometrics49, 125.pdf](2000/Scientometrics49,%20125.pdf)

Abstract: To analyse the relationship between research group size and scientific productivity within the highly cooperative research environment characteristic of contemporary biomedical science, an investigation of Norwegian Microbiology was undertaken. By an author-gated retrieval from ISI’s database National Science Indicators on Diskette (NSIOD), of journal articles published by Norwegian scientists involved in microbiological research during the period 1992-1996, a total of 976 microbiological and 938 non-microbiological articles, by 3, 486 authors, were obtained. Functional research groups were defined bibliometrically on the basis of co-authorship, yielding a total of 180 research groups varying in size from one author, one article to 180 authors, 83 articles (all authors associated with a group during the whole five-year period were included, hence the large group size). Most of Norwegian microbiological research (73% of the microbiology articles) appears to be performed by specialist groups (with greater than or equal to 70% of their production as microbiology), the remainder being published by groups with a broader biomedical research profile (who were responsible for 95% of the non- microbiological articles). The productivity (articles per capita) showed only moderate (Poisson-distributed) variability between groups, and was remarkably constant across all subfields, at about 0.1 article per author per year. No correlation between group size and productivity was found

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Biomedical Research, Co-Authorship, Correlation, Determinants, Environment, Group, Groups, Investigation, Journal, Microbiology, Production, Productivity, Profile, Research, Research Collaboration, Science, Scientific Productivity, Size, Variability

Thorsteinsdottir, O.H. (2000), External research collaboration in two small science systems. *Scientometrics*, **49** (1), 145-160.

Full Text: [2000\Scientometrics49, 145.pdf](2000/Scientometrics49,%20145.pdf)

Abstract: This paper compares external research collaboration in small science systems. The design involves studying research collaboration in an independent country (Iceland) and a region of a large country (Newfoundland, Canada). The objective of the paper is firstly to gain a deeper understanding of external research collaboration in small science systems by using both quantitative and qualitative methods and secondly to examine if it is justifiable to compare small regions and small independent countries in terms of their scientific activities. The two science systems are compared with respect to their publication patterns in order to explore how comparable they are in their scientific profiles. External collaboration rates for both science systems are then measured and compared, and it is shown that research collaboration plays an important part in the two science systems. The role of research collaboration is examined further with a combination of bibliometric analysis and interview data. It was found that scientists in small science systems do not collaborate only because they lack economic resources, but an important reason for their collaboration was the availability of research material which was in demand by scientists in the wider scientific world.

Keywords: Analysis, Availability, Bibliometric, Bibliometric Analysis, Canada, Collaboration, Community, Cooperation, Design, Economic, International Scientific Collaboration, Methods, Order, Paper, Profiles, Publication, Qualitative, Qualitative Methods, Research, Research Collaboration, Role, Science, Universities

Von Ungern-Sternberg, S. (2000), Bradford’s law in the context of information provision. *Scientometrics*, **49** (1), 161-186.

Full Text: [2000\Scientometrics49, 161.pdf](2000/Scientometrics49,%20161.pdf)

Abstract: The aim of the study is to study empirical use of Bradford’s law for decisions concerning information systems in problem based fields, were journals from different disciplines cover relevant information. Results of comparison of the cores in different fields can be used as a base for tailoring an information system. Bradford’s law is in the study applied on five databases in the topic ‘Information retrieval and seeking’ in order to compare the size and titles of the core journals. These databases give different views of the same interdisciplinary topic. Problems are relevance judgements, which change the shape of the graphs, and consistency of concepts in the analysis. The results show that. Bradford analyses can be useful tools in developing information systems.

Keywords: Analysis, Base, Bibliometrics, Comparison, Core, Databases, Distributions, Field, Information, Information System, Interdisciplinary, Law, Order, Size, Tools

? Braun, T. and Glänzel, W. (2000), Chemistry research in Eastern Central Europe (1992-1997): Facts and figures on publication output and citation impact. *Scientometrics*, **49** (2), 187-213.

Full Text: Scientometrics49, 187

Keywords: 27 Science Areas, Newest Version, Life Sciences, Scientometric Indicators, Relative Indicators, World Science, 50 Nations, Countries, Physics, Fields

? Pestaña, A. and Cerdán, S. (2000), Spanish scientific productivity and equipment in magnetic resonance from a regional and European perspective. *Scientometrics*, **49** (2), 215-231.

Full Text: [2000\Scientometrics49, 215.pdf](2000/Scientometrics49,%20215.pdf)

Abstract: The aim of this work was to provide a rational frame for the design of scientific policies in MR infrastructure implementation. To this end, we have investigated the relationships between MR instruments, their scientific productivity or medical performance and several socio-economic, R&D or health care indicators in a Spanish and European context. The distribution of MR spectroscopy instruments among Spanish Autonomous Communities suggests that the allocation policy resulted from a compromise between the pull of demand based on regional strength in R&D activities and the push of convergence criteria to bring underdeveloped regions up to a national standard. On the whole. the average value for Spanish MR spectroscopy equipment(1.6 units per TRDP) was within the average value of 1.7 found in 6 European countries. The scientific productivity of these spectometres in Spain (10.3 publications per unit), compares with the ratio (12.4) found in the United Kingdom and was above the six countries’ average (8.3). Larger differences in productivity were observed between Spanish Autonomous Communities, suggesting the existence of important laguna in the distributive side of the allocation policy. Consistent with its socio-sanitary importance. the regional distribution of MR imaging equipment in Spain correlated with the number of sanitary personnel and regional population or wealth. The average number of installed units per million inhabitants in Spain (3.3) is very close to the average found in five European countries and the diagnostic procedures per installed units are close to the 5 countries’ average values of 3400/year. However, the scientific productivity of MR imaging equipment in Spain (1.6 publications per installed unit in the five year period) was very low as compared with other European countries (3.7 on average). Higher diagnostic demand or lower publication pressures could explain these differences equally well. Our results suggest that increases in scientific productivity and medical performance of MR instrumentation in Spanish Autonomous Communities may not necessarily involve a net increase in the number of MR instruments but rather, improvements in the global socio-economic throughputs derived from the organisation of R&D and medical service policies.

Keywords: Allocation, Design, Distribution, Global, Health, Health Care, Imaging, Implementation, Importance, Indicators, Instrumentation, Low, Magnetic, Magnetic Resonance, Medical, MR, MR Imaging, Performance, Policy, Population, Productivity, Publication, Publications, Regional, Regional Distribution, Resonance, Scientific Productivity, Socio-Economic, Spain, Spectroscopy, Standard, Strength, United Kingdom

Rovira, L., Senra, P. and Jou, D. (2000), Bibliometric analysis of physics in Catalonia: Towards quality consolidation? *Scientometrics*, **49** (2), 233-256.

Full Text: [2000\Scientometrics49, 233.pdf](2000/Scientometrics49,%20233.pdf)

Abstract: This paper studies the main bibliometric figures in order to analyse the ‘states of the art’ and the evolution of research in physics in Catalonia (Spain) between 1981 and 1998 via the National Citation Report (NCR) for Catalonia elaborated by ISI (Institute for Scientific Information). The main indicators and parameters used are: bibliometric size, rate of citation, citedness of papers, concentration of scientific categories, journals and types of paper, index of immediacy, international collaboration, and papers and citation distribution by research centres and universities.

? Bar-Ilan, J. (2000), Results of an extensive search for ‘S&T indicators’ on the Web: A content analysis. *Scientometrics*, **49** (2), 257-277.

Full Text: [2000\Scientometrics49, 257.pdf](2000/Scientometrics49,%20257.pdf)

Abstract: In this study we carried out a content analysis of Web pages containing the search term ‘S&T indicators’. which were located by an extensive search of the Web. Our results dearly show that the Web is a valuable information source on this topic. Major national and international institutions and organizations publish the frill text of their reports on the Web. or allow free downloading of these reports in non-html formats. In addition to direct information, a number of pages listing and linking to major reports, programs and organizations were also located.

Keywords: Analysis, Content Analysis, Engines, Information, Institutions, Internet, Organizations, Overlap, Pages, Political-Parties, Source, World-Wide-Web

Karki, M.M.S., Garg, K.C. and Sharma, P. (2000), Activity and growth of organic chemistry research in India during 1971-1989. *Scientometrics*, **49** (2), 279-288.

Full Text: [S\Scientometrics49, 279.pdf](S/Scientometrics49,%20279.pdf)

Abstract: The paper investigates Indian organic chemistry research activity during 1971–1989 using Chemical Abstracts. It attempts at quantification of national contribution to world efforts, and identify areas of relative strengths and weaknesses. Also models the growth of Indian organic chemistry output to world organic chemistry output as a whole and in sub-fields where the activity index for the world and India are similar.

Shama, G., Klaus, K. and Oppenheim, C. (2000), Citation ootprint analysis Part I: UK and US chemical engineering academics. *Scientometrics*, **49** (2), 289-305.

Full Text: [S\Scientometrics49, 289.pdf](S/Scientometrics49,%20289.pdf)

Abstract: A novel method of displaying the publication and citation characteristics of outputs of researchers using a graphical ‘footprint’ has been developed. Its first application has been to compare the publication and citation characteristics of a small group of top UK, and US academic chemical engineers. The footprint demonstrates the Relationship Factors of publications in a number of related disciplines, as defined by ISI’s Journal Citation Reports. The technique has been used to compare both individual academics and each national group as a whole. The results clearly show that US academic chemical engineers are far more interdisciplinary in their output than their UK counterparts. The technique has a number of potential applications, including tracking changes in a discipline over time, tracking individual academics’ output over time, and comparing different disciplines for their interdisciplinarity.

? Pereira, J.C.R., Fischer, A.L. and Escuder, M.M.L. (2000), Driving factors of high performance in Brazilian Management Sciences for the 1981-1995 period. *Scientometrics*, **49** (2), 307-319.

Full Text: [2000\Scientometrics49, 307.pdf](2000/Scientometrics49,%20307.pdf)

Abstract: As a corollary of former studies, high performance in Brazilian Management Sciences during the period of 1981 to 1995 is put to scrutiny. Information on the 66 papers registered to this field in the ISI databases for this time interval were retrieved, edited and processed as to elicit patterns. Occurrences of highly cited papers seemed haphazard but the presence of collaborative work consistently emerged as an important driving factor for good performance. International collaboration showed the most expressive impact over chances of citation but any form of collaboration seemed to have some effect, even those represented by single authors with double allegiance. Simple addition of authors, nonetheless, had no effect, and thus collaboration involving authors of common institutional affiliation showed the performance of single authored papers. Cluster analysis allowed the identification of patterns of performance, and groups of best performers showed higher levels of international collaboration. The institutional composition of the clusters is presented.

Keywords: Analysis, Citation, Clusters, Collaboration, Composition, Databases, Driving, Groups, Identification, Impact, International Collaboration, ISI, Levels, Performance

? Gupta, B.M. and Karisiddappa, C.R. (2000), Modelling the growth of literature in the area of theoretical population genetics. *Scientometrics*, **49** (2), 321-355.

Full Text: [2000\Scientometrics49, 321.pdf](2000/Scientometrics49,%20321.pdf)

Abstract: Different approaches are introduced for studying the growth of scientific knowledge, as reflected through publications and authors. Selected growth models are applied to the cumulated growth of publications and authors in theoretical population genetics from 1907 to 1980. The criteria are studied on which growth models are to be selected for their possible application in the growth of literature. It is concluded that the power model is observed to be the only model among the models studied which best explains the cumulative growth of publication and author counts in the theoretical population genetics.

Keywords: Genetics, Growth, Knowledge, Model, Models, Population, Publication, Publications, Science

Glänzel, W. (2000), Science in Scandinavia: A bibliometric approach. *Scientometrics*, **49** (2), 357-357.

Full Text: [2000\Scientometrics49, 357.pdf](2000/Scientometrics49,%20357.pdf)

Ortiz-Rivera, L.A., Sanz-Casado, E. and Suárez-Balseiro, C.A. (2000), Scientific production in Puerto Rico in science and technology during the period 1990 to 1998. *Scientometrics*, **49** (3), 403-418.

Full Text: [2000\Scientometrics49, 403.pdf](2000/Scientometrics49,%20403.pdf)

Abstract: This paper analyses the research activity conducted by Puerto Rican scientists in science and technology in the period 1990 to 1998. The Science Citation Index (SCI) database was used to analyse scientific production by geographic area, type of institution, document typology, language coverage, visibility of publications, subjects addressed and collaboration between local and international authors and institutions. Scientific production was observed to nearly double over the period studied and found to be concentrated in the academic sector, primarily in the city of San Juan, specifically in the University of Puerto Rico’s Rio Piedras, Medical Sciences and Mayaguez campuses. Puerto Rican scientific production in the period studied was greater than in any other Caribbean country and the sixth largest in all of Latin America. papers are mainly published in highly visible journals and scientific articles are the vehicle most commonly used to reach the scientific community. Go-operation indices between authors and institutions are high and the principal areas in which research is published are Medicine, Chemistry, Life Sciences and Physics.

Keywords: Latin-America, Research Collaboration, Bibliometric Analysis, Cooperation, Indicators, Authorship, Quality

? Garg, K.C. and Padhi, P. (2000), Scientometrics of prolific and non-prolific authors in laser science and technology. *Scientometrics*, **49** (3), 359-371.

Full Text: 2000\Scientometrics49, 359.pdf

Abstract: An analysis of 766 publications by prolific authors in scientific journals indicate that prolific authors produce about 25% of the total scientific output in periodical literature in laser science and technology. The average productivity per author is about 2. Prolific authors from most of the countries belonged either to academic or research institutions except in USA and Japan. Prolific authors on average made more impact than non-prolific authors. However the situation varied from country to country.

Keywords: Impact, Journals, Literature, Periodical, Productivity, Publications, Research, Research Institutions, Science, Science And Technology, Scientific Journals, Scientific Output, Scientometrics, Technology, USA

? Cahlik, T. (2000), Comparison of the maps of science. *Scientometrics*, **49** (3), 373-387.

Full Text: 2000\Scientometrics49, 373.pdf

Abstract: The aim of this article is to describe some methods of comparison of maps of science and to show possibilities that these methods give for further research in this interesting area.

Keywords: Comparison, Methods, Research, Science, Word

? Cahlik, T. (2000), Search for fundamental articles in economics. *Scientometrics*, **49** (3), 389-402.

Full Text: 2000\Scientometrics49, 389.pdf

Abstract: The aim of this article is to demonstrate on the scientific field “economics” the search for fundamental articles. Co-word analysis and co-citation analysis enable to visualize the structure of a scientific field on the maps of science. Then we can find the fundamental themes on the maps. After finding the articles belonging to these fundamental themes we can discuss the fundamentality of the formers, too.

Keywords: Articles, Co-Citation, Co-Citation Analysis, Cocitation Analysis, Economics, Journals, Science

? Ortiz-Rivera, L.A., Sanz-Casado, E. and Suarez-Balseiro, C.A. (2000), Scientific production in Puerto Rico in science and technology during the period 1990 to 1998. *Scientometrics*, **49** (3), 403-418.

Full Text: 2000\Scientometrics49, 403.pdf

Abstract: This paper analyses the research activity conducted by Puerto Rican scientists in science and technology in the period 1990 to 1998. The Science Citation Index (SCI) database was used to analyse scientific production by geographic area, type of institution, document typology, language coverage, visibility of publications, subjects addressed and collaboration between local and international authors and institutions. Scientific production was observed to nearly double over the period studied and found to be concentrated in the academic sector, primarily in the city of San Juan, specifically in the University of Puerto Rico’s Rio Piedras, Medical Sciences and Mayaguez campuses. Puerto Rican scientific production in the period studied was greater than in any other Caribbean country and the sixth largest in all of Latin America. Papers are mainly published in highly visible journals and scientific articles are the vehicle most commonly used to reach the scientific community. Go-operation indices between authors and institutions are high and the principal areas in which research is published are Medicine, Chemistry, Life Sciences and Physics.

Keywords: Academic Sector, Articles, Authorship, Bibliometric Analysis, Chemistry, Citation, Collaboration, Cooperation, Coverage, Database, Indicators, Journals, Latin America, Latin-America, Local, Physics, Publications, Puerto Rico, Quality, Research, Research Activity, Research Collaboration, SCI, Science, Science And Technology, Science Citation Index, Scientific Production, Technology, University, Visibility

? Dietz, J.S., Chompalov, I., Bozeman, B., Lane, E.O. and Park, J. (2000), Using the curriculum vita to study the career paths of scientists and engineers: An exploratory assessment. *Scientometrics*, **49** (3), 419-442.

Full Text: 2000\Scientometrics49, 419.pdf

Abstract: In this paper we assess the utility of the curriculum vita (CV) as a data source for examining the career paths of scientists and engineers. CVs were obtained in response to an email message sent to researchers working in the areas of biotechnology and microelectronics. In addition, a number of CVs were obtained “passively” from a search of the Internet. We discuss the methodological issues and problems of this data collection strategy and the results from an exploratory analysis using OLS regression and event history analysis. In sum, despite difficulties with coding and variation in CV formats, this collection strategy seems to us to hold much promise.

Keywords: Academic Careers, Agency, Agreement, Assessment, Biotechnology, Cycle Research Productivity, Data Collection, Faculty, History, Internet, Life-Cycle, Model, Rank, Regression, Researchers, Science, Sex-Differences

Abt, H.A. (2000), The reference-frequency relation in the physical sciences. *Scientometrics*, **49** (3), 443-451.

Full Text: [S\Scientometrics49, 443.pdf](S/Scientometrics49,%20443.pdf)

Abstract: We counted references in about 200 research papers in each of 16 journals in six physical sciences. They show that for average papers, the number of references is a linear function of the paper length. In fact, it is the same function for journals in different sciences. The fact that various physical sciences all give the same reference frequencies for papers of the same length and impact factor tells us that citation counts in those sciences can be intercompared. There is a dependence upon impact factor and a general relation is derived. In addition, the number of references increases by about 1.5% per year, probably due to the increase in the literature pertinent to any paper. The average paper lengths differ among the six sciences and three possible explanations for that difference are given.

? Prpić, K. (2000), The publication productivity of young scientists: An empirical study. *Scientometrics*, **49** (3), 453-490.

Full Text: [2000\Scientometrics49, 453.pdf](2000/Scientometrics49,%20453.pdf)

Abstract: This research was conducted on a sample of 840 respondents who represent half of the Croatian population of young scientists. There are three main features which define the publication productivity of young scientists. 1) Despite the worsened position of R & D, they publish more scientific papers than the young generations of scientists at the beginning of the nineties. 2) Differences between a highly-productive minority, which produces on average half of all scientific publications, and a low-productive majority is already apparent in young scientists. 3) The productivity of young scientists is formed according to productivity patterns typical of particular scientific fields and disciplines. With regard to the explanation of productivity, the following has been found. a) An expansion of the set of predictors resulted in an improvement in the explanation of the productivity of young scientists compared with previous surveys. b) Among the factors which contribute significantly to the explanation of the quantity of scientific publications, the most powerful predictor is attendance at conferences abroad, followed by scientific qualifications and some gatekeeping variables. c) Besides certain similarities, scientific fields also show a specific structure of determinants of young scientists’ productivity.

Keywords: Bibliometric Indicators, Community, Cum Laude Doctorates, Determinants, Features, Fields, Population, Position, Predictors, Productivity, Publication, Publications, Quantity, Questionnaire, Research, Research Performance, Rise, Science, Scientific Publications, Structure, Surveys

Tsay, M.Y., Jou, S.J. and Ma, S.S. (2000), A bibliometric study of semiconductor literature, 1978-1997. *Scientometrics*, **49** (3), 491-509.

Full Text: [S\Scientometrics49, 491.pdf](S/Scientometrics49,%20491.pdf)

Abstract: Semiconductor is the key element for information industry. The present study investigated the growth of semiconductor literature based on the database of INSPEC. Well-established bibliometric techniques, such as Bradford-Zipf’s plot and Lotka’s law have been employed to further explore the characteristics of semiconductor literature. Quantitative results on the literature growth, form of publication, research treatment, publishing country and language, author productivity and affiliate are reported. Moreover, from the Bradford-Zipf’s plot, 25 core journals in semiconductor were identified and analyzed.

? Ramani, S.V. and de Looze, M.A. (2000), A note on using patent statistics to obtain competition indicators. *Scientometrics*, **49** (3), 511-515.

Full Text: [2000\Scientometrics49, 511.pdf](2000/Scientometrics49,%20511.pdf)

Abstract: In a recent article a set of indicators have been proposed drawing upon patent statistics, which are meant to describe and compare firm and national research competence. However this article has raised more questions on the validity of such indicators as well as on their use. We have thus examined these issues so as to clarify the nature of the problems involved in the construction of competence and competitive indicators of firms and nations and their subsequent implementation on data bases.

Keywords: Competence, Competition, Implementation, Indicators, Recent, Research, Statistics, Validity

? Balaban, A.T. and Randic, M. (2000), Proposal for using an untapped source of citations characterizing scientific areas. *Scientometrics*, **49** (3), 517-521.

Full Text: [2000\Scientometrics49, 517.pdf](2000/Scientometrics49,%20517.pdf)

Abstract: Bibliographies of ‘reference books’, namely Encyclopedias, Comprehensive Treatises, and Advanced Textbooks constitute a valuable source of information about seminal papers in various branches of science. Examples are given mainly for chemistry, but other areas might be treated similarly. Bibliographies of ‘reference books’, namely Encyclopedias, Comprehensive Treatises, and Advanced Textbooks constitute a valuable source of information about seminal papers in various branches of science. Examples are given mainly for chemistry, but other areas might be treated similarly.

Keywords: Citations, Information, Science, Source

Turner, W.A., Gherbi, R., Jacquemin, C. and Leger, M.D. (2001), Infometric methods and measures for sharing knowledge over Internet. *Scientometrics*, **50** (1), 33-57.

Full Text: [S\Scientometrics50, 33.pdf](S/Scientometrics50,%2033.pdf)

Abstract: This paper deals with knowledge sharing over Internet. After defining the concept, we will discuss work aimed at creating a technical system to implement it and at measuring the quality of results obtained. However, the reader will quickly see that the text is organized to address the theme of this special issue of Scientometrics. Models, methods and measures characterize scientometric research. What problems arise in attempting to develop them for internet? In order to answer this question, it is important to distinguish between two schools of practice in the scientometric research field: the first derives from applied statistics and is called bibliometrics, the second derives from cognitive sociology and is called infometrics (Turner, 1994).

? van Raan, A.F.J. (2001), Bibliometrics and Internet: Some observations and expectations. *Scientometrics*, **50** (1), 59-63.

Full Text: [2001\Scientometrics50, 59.pdf](2001/Scientometrics50,%2059.pdf)

Abstract: Electronic publishing developments and new information technology in general will affect the main functions of scientific communication. Most changes however will be primarily technological hut not conceptual. Publication via journals of high reputation is in most fields of science crucial to receive professional recognition. That will remain so in the ‘electronic era’. A much more revolutionary change in science will be the increasing availability and sharing of research data.

Keywords: ERA, Journals, Publishing, Research, Scientists

? Noyons, E. (2001), Bibliometric mapping of science in a science policy context. *Scientometrics*, **50** (1), 83-98.

Full Text: [2001\Scientometrics50, 83.pdf](2001/Scientometrics50,%2083.pdf)

Abstract: Despite the promising introduction of bibliometric maps of science in a science policy context in the nineteen seventies, they have not been very successful yet. It seems, however, that only now they are becoming acknowledged as a useful tool. This is mainly due to the developments and integration of hypertext and graphical interfaces. Because of this, the strength of such navigation tools becomes obvious. The communication through the Internet enables the field expert (as a kind of peer review) as well as the user (from a science policy context) to contribute to the quality of the map and the interface. Moreover, the interface can provide suggestions to answer policy-related question, which is the initial purpose of such maps.

Keywords: Bibliometric, Citation Analysis, Co-Word Analysis, Map, Scientific Literatures

Schubert, A. (2001), Scientometrics: A citation based bibliography 1997-2000. *Scientometrics*, **50** (1), 99-198.

Full Text: [S\Scientometrics50, 99.pdf](S/Scientometrics50,%2099.pdf)

Glänzel, W. and Schubert, A. (2001), Double effort = Double impact? A critical view at international co-authorship in chemistry. *Scientometrics*, **50** (2), 199-214.

Full Text: [2001\Scientometrics50, 199.pdf](2001/Scientometrics50,%20199.pdf)

Abstract: An attempt is made to find statistical evidences of the relation between international co-authorship and citation impact. It was found that international co-authorship, in average, results inpublications with higher citation rates than purely domestic papers. No correlation has beenfound, however, between the strength of co-authorship links and the relative citation eminence ofthe resulting publications. International co-authorship links in chemistry, as represented by thewell-known Salton’s measure, displayed a characteristic pattern reflecting geopolitical, historical, linguistic, etc. relations among countries. A new indicator, representing also the asymmetry ofco-authorship links was used to reveal main ‘attractive’ and ‘repulsive’ centres of co-operation.

? Vilanova, M.R. and Leydesdorff, L. (2001), Why Catalonia cannot be considered as a regional innovation system. *Scientometrics*, **50** (2), 215-240.

Full Text: [2001\Scientometrics50, 215.pdf](2001/Scientometrics50,%20215.pdf)

Abstract: We present a model to assess the systemness of an innovation system. Patent and citation data with an institutional address in Catalonia (1986-1996) were analyzed in terms of relational linkages and the development in these distributions over time was evaluated using methods from systems dynamics. Relational linkages are extremely scarce. A transition at the system’s level could be indicated around 1990 when using institutional addresses, but not when using cognitive categories. The institutional restructuring has led to changes in the pattern of linkages (coauthorship. etc.), but the reproduction of the system’s knowledge base has remained differentiated. We conclude that although a system in several other respects, Catalonia cannot (yet) be considered as a (knowledge-based) innovation system. The existence of a mechanism for the integration could not be indicated at the regional level.

Keywords: Citation, European-Union, Industry-Government Relations, Integration, Mechanism, Patent Statistics, Science, System, Technology, Triple-Helix

? Leta, J., Jacques, R., Figueira, I. and de Meis, L. (2001), Central international visibility of Brazilian psychiatric publications from 1981 to 1999. *Scientometrics*, **50** (2), 241-254.

Full Text: [2001\Scientometrics50, 241.pdf](2001/Scientometrics50,%20241.pdf)

Abstract: In this study, we examine the scientific output of Brazilian psychiatry, based on the database of the Institute for Scientific Information (ISI). publications in the 10 most important psychiatric journals, and publications in major Brazilian journals, The number of Brazilian publications (i.e., those carrying at least one Brazilian address) in psychiatry in the ISI database increased by 168% during the If-year period under study (1981-1995). Despite this growth, the relative contribution of publications in psychiatry to the country’s publications in medical sciences did not change over the 15-year period. This fraction, around 2%, remained at less than one-third of the average contribution of psychiatry journals to publications in medicine worldwide. The impact inferred from number of citations (1981-1992) shows that Brazilian articles in psychiatry were cited less than the world average in this field. In the 10 psychiatry journals with the highest impact. Brazilian authors published only 48 articles in the 1981-1995 period, representing only 0.2% of the articles in those journals. Like their American and British counterparts. Brazilian psychiatrists also published primarily in domestic journals: 87.1% of the publications by Brazilians appeared in the two major Brazilian psychiatric journals, compared with only 12.9% in foreign journals. Among publications in psychiatry in the ISI database, the number of articles co-authored by Brazilians with scientists from other countries increased 12.3 fold from 1981-1985 to 1991-1995. representing at the end 50% of all publications by Brazilian psychiatrists in international journals. Despite all cuts in funding for Brazilian science during the last decades, all of the articles in our sample originated in public universities, and only 10 universities were responsible for similar to 70% of the publications by Brazilian psychiatrists in our survey period. We conclude that Brazilian psychiatric research is a subject worthy of particular concern. especially if we take into account the country’s modest scientific performance and the socio-economic consequences of mental disorders in the Brazilian population.

Keywords: Articles, Citations, Contribution, Database, Impact, Impact Factors, ISI, ISI Database, Journals, Medical, Medicine, Mental Disorders, Profile, Psychiatry, Publications, Research, Science, Scientific Output, Scientific Performance, Universities, Visibility

? Andersen, H. (2001), The norm of universalism in sciences. Social origin and gender of researchers in Denmark. *Scientometrics*, **50** (2), 255-272.

Full Text: [2001\Scientometrics50, 255.pdf](2001/Scientometrics50,%20255.pdf)

Abstract: Implied by the norm of universalism in modern science, known from Merton’s CUDOS-norm set, is the demand that scientific careers should be open to talents, independent of personal attributes such as race, religion, class, and gender. In spite of a large amount of studies related to CUDOS-norms very few deals with class origin of researchers. Based on a survey among a sample of 788 Danish researchers this article investigates class bias, compared to I:ender bias in researcher recruitment and careers, and researcher assessments of impartiality and objectivity of evaluations and reward system. The data demonstrate very strong class bias, and also confirm the well-known gender bias in recruitment, class bias being the strongest. This is shown to be mainly because of bias in the educational system, however. Concerning later career attainment bias is also found, but much weaker, and most pronounced concerning social origin. Regarding researcher assessments of impartiality there are no indications of strong mistrust among researchers in general, nor are there significant differences in degree of trust in reward system, conditioned by class origin or gender. In conclusion, the analysis does not lend strong support to an assumption of deviance from norms of universalism.

Keywords: Researchers, Science, System

Yong, F. and Rousseau, R. (2001), Lattices in citation networks: An investigation into the structure of citation graphs. *Scientometrics*, **50** (2), 273-287.

Full Text: [2001\Scientometrics50, 273.pdf](2001/Scientometrics50,%20273.pdf)

Abstract: The main purposes of this article are to uncover interesting features in real-world citationnetworks, and to highlight important substructures. In particular, it applies lattice theory tocitation analysis. On the applied side, it shows that lattice substructures exist in real-word citationnetworks. It is further shown that, through its relations with co-citations and bibliographiccoupling, the diamond (a four-element lattice) is a basic structural element in citation analysis. Finally, citation compactness is calculated for the four- and five element lattices.

Salzarulo, L and Von Ins, M. (2001), Bias, structure and quality in citation indexing. *Scientometrics*, **50** (2), 289-299.

Full Text: [2001\Scientometrics50, 289.pdf](2001/Scientometrics50,%20289.pdf)

Abstract: The small size of institutes and publication clusters is a problem when determining citationindices. To improve the citation indexing of small sets of publications (less than 50 or 100 publications), a method is proposed. In addition, a method for error calculation is given for largesets of publications. Here, the classical methods of citation indexing remain valid.

Schoepflin, U. and Glänzel, W. (2001), Two decades of ‘scientometrics’: An interdisciplinary field represented by its leading journal. *Scientometrics*, **50** (2), 301-312.

Full Text: [2001\Scientometrics50, 301.pdf](2001/Scientometrics50,%20301.pdf)

Abstract: The development of the field of bibliometric and scientometric research is analysed by quantitative methods to answer the following questions: (1) Is bibliometrics evolving from a soft science field towards rather hard (social) sciences (Schubert- Maczelka hypothesis)? (2) Can bibliometrics be characterised as a social science field with stable characteristics (Wouters- Leydesdorff hypothesis)? (3) Is bibliometrics a heterogeneous field. the sub-disciplines of which have their own characteristics? Are these sub-disciplines more and more consolidating, and are predominant sub-disciplines impressing their own characteristics upon the whole field (Glänzel - Schoepflin hypothesis)? The Price Index per paper, the percentage of references to serials, the mean references age, and the mean reference rate are calculated based on all articles and their respective references in Scientometrics in 1980, 1989, and 1997. The articles are classified in six categories. The findings suggest, that the field is in fact heterogeneous, and each sub-discipline has its own characteristics. While the contribution of these sub- disciplines in Scientometrics was still well-balanced in 1980, papers dealing with case studies and methodology became dominant by 1997.

Keywords: Sciences

? Rai, L.P., Kumar, N. and Madan, S. (2001), Structural changes in S&T research in India. *Scientometrics*, **50** (2), 313-321.

Full Text: [2001\Scientometrics50, 313.pdf](2001/Scientometrics50,%20313.pdf)

Abstract: Before India became an independent country, its scientists and policy maker!, could foresee the importance of science in its development, and accordingly a number of research and development (R&D) institutions were established. However during these five decades of independence, the choice between basic sciences and technology was always a subject of debate. It will be appropriate now to examine the changing patter ns of Science and Technology (S&T) manpower growth to find out the ground truth reality. The present study pertains to the analysis of S&T outturn data in various fields of scientific research that can provide a base for SET planning and policy making. These S&T indicators will be helpful in estimating future requirements, which in turn can be useful to a great extent in science and technology policy formulation. These estimates and future projections are based on mathematical modelling of the data pertaining to the outturn of highly qualified Scientific and Technical (S&T) personnel in India from different faculties over the period 1990-1998. From the trend analysis it is evident that research is no more perceived as an interesting career except in the field of engineering and medicine. The findings further suggest that there is a noticeable shift from basic sciences to technology.

Keywords: Mathematical Modelling, Medicine, Modelling, R&D, Research, Research And Development, Science, Science And Technology, Technology

Huber, J.C. and Wagner-Döbler, R. (2001), Scientific production: A statistical analysis of authors in mathematical logic. *Scientometrics*, **50** (2), 323-337.

Full Text: [2001\Scientometrics50, 323.pdf](2001/Scientometrics50,%20323.pdf)

Abstract: We show that scientific production can be described by two variables: rate of production (rate of publications) and career duration. For mathematical logicians, we show that the time pattern of production is random and Poisson distributed, contrary to the theory of cumulative advantage. We show that the exponential distribution provides excellent goodness-of-fit to rate of production and a reasonable fit to career duration. The good fits to these distributions can be explained naturally from the statistics of exceedances. Thus, more powerful statistical tests and a better theoretical foundation is obtained for rate of production and career duration than has been the case for Lotka’s Law.

Persson, O. (2001), All author citations versus first author citations. *Scientometrics*, **50** (2), 339-344.

Full Text: [2001\Scientometrics50, 339.pdf](2001/Scientometrics50,%20339.pdf)

Abstract: Based on a set of information science papers this study demonstrates that ‘all author’ citationcounts should be preferred when visualizing the structure of research fields. ‘First author’ citationstudies distort the picture in terms of most influential researchers, while the subfield structuretends to be just about the same for both methods.

? Burrell, Q.L. (2001), Some remarks on a paper by Egghe. *Scientometrics*, **50** (2), 345-350.

Full Text: [2001\Scientometrics50, 345.pdf](2001/Scientometrics50,%20345.pdf)

? Egghe, L. (2001), Comments on the “Letter to the Editor” by Burrell. *Scientometrics*, **50** (2), 351.

Full Text: [2001\Scientometrics50, 351.pdf](2001/Scientometrics50,%20351.pdf)

Kostoff, R.N. (2001), The metrics of science and technology. *Scientometrics*, **50** (2), 353-361.

Full Text: [2001\Scientometrics50, 353.pdf](2001/Scientometrics50,%20353.pdf)

Egghe, L. (2001), A heuristic study of the first-citation distribution. *Scientometrics*, **50** (2), 363-363.

Full Text: [2001\Scientometrics50, 363.pdf](2001/Scientometrics50,%20363.pdf)

Jarneving, B. (2001), The cognitive structure of current cardiovascular research. *Scientometrics*, **50** (3), 365-389.

Full Text: [S\Scientometrics50, 365.pdf](S/Scientometrics50,%20365.pdf)

Abstract: This paper presents a citation analysis of the cognitive structure of current cardiovascular research. Used methods are co-citation analysis, bibliographic coupling and quantitative analysis of title words. Tables and graphs reveal: (1) The journal co-citation structure, (2) the cognitive content and the bibliometric structure of clusters based on co-citation: (3) the cognitive content and the bibliometric structure of clusters based on bibliographic coupling. A predominance of different research aspects on coronary artery disease was found in clusters based on co-citations as well as in dusters based on bibliographic coupling

Keywords: Bibliometric, Citation, Methods, Research, Science, Scientific Literatures, Scientometrics

? Ojasoo, T., Maisonneuve, H. and Dore, J.C. (2001), Evaluating publication trends in clinical research: How reliable are medical databases? *Scientometrics*, **50** (3), 391-404.

Full Text: [2001\Scientometrics50, 391.pdf](2001/Scientometrics50,%20391.pdf)

Abstract: The aim of this study was to draw attention to the possible existence of “quirks” in bibliographic databases and to discuss their implications. We analysed the time-trends of “publication types” (PTs) relating to clinical medicine in the most frequently searched medical database, MEDLINE. We counted the number of entries corresponding to 10 PTs indexed in MEDLINE (1963-1998) and drew up a matrix of [10 PTs x 36 years] which we analysed by correspondence factor analysis (CFA). The analysis showed that, although the “internal clock” of the database was broadly consistent, there were periods of erratic activity. Thus, observed trends might not always reflect true publication trends in clinical medicine but quirks in MEDLINE indexing of PTs. There may be, for instance, different limits for retrospective tagging of entries relating to different PTs. The time-trend for Reviews of Reported Cases differed substantially from that of other publication types. Despite the quirks, quite rational explanations could be provided for the strongest correlations among PTs. The main factorial map revealed how the advent of the Randomised Controlled Trial (RCT) and the accumulation of a critical mass of literature may have increased the rate of publication of research syntheses (meta-analyses, practice guidelines...). The RCT is now the “gold standard” in clinical investigation and is often a key component of formal “systematic reviews” of the literature. Medical journal editors have largely contributed to this situation and thus helped to foster the birth and development of a new paradigm, “evidence based medicine” which assumes that expert opinion is biased and therefore relies heavily - virtually exclusively on critical analysis of the peer-reviewed literature. Our exploratory factor analysis, however, leads us to question the consistency of MEDLINE’s indexing procedures and also the rationale for MEDLINE’s choice of descriptors. Databases have biases of their own, some of which are not independent of expert opinion. User-friendliness should not make us forget that outputs depend on how the databases are constructed and structured.

Keywords: Countries, Database, Databases, Factor Analysis, Literature, Medical, Medicine, Medline, Paradigm, Publication, Research, Science

? dos Santos, N.F. and Rumjanek, V.M. (2001), Brazilian immunology: One hundred years later. *Scientometrics*, **50** (3), 405-418.

Full Text: [2001\Scientometrics50, 405.pdf](2001/Scientometrics50,%20405.pdf)

Abstract: Brazilian immunology dates from the end of the 19(th) century. The aim of the present paper was to analyze the impact of this field in contemporary Brazilian biomedical research. For this, a 15 years period (1981-1995) was studied. Production of immunological articles in Brazil represented in 1995 a percentage of 8.66 of total papers in biomedical sciences in this country. This level was achieved by an exponential increase in 1991 in the number of papers in immunology followed by a steady increase in the subsequent years. This growth was only observed in articles published in international immunology journals listed by ISI, a similar increase did not occur when the most representative Brazilian journal in biomedical sciences was analyzed. The production in immunology in the last five years (1991-1995) represented 60.69% of total articles in this field published in the whole 15 years period. When quality was assessed based on impact factor of the journals were the articles appeared, 52.71% of total immunology papers had been published in journals with impact factors varying between 7.29 and 3.24. A higher degree of international co-authorship was seen both in articles published in international journals and presentations at international congresses compared to national ones. The main countries collaborating with Brazil were: EUA. England and France. Within Brazil, immunology research was not equally distributed. Around 80% of the articles were produced by four states (Sao Paulo, Rio de Janeiro, Minas Gerais and Bahia). Sao Paulo being responsible for more than half of those articles. This geographic distribution closely resembles the distribution of the Brazilian Society of Immunology (SBI) membership. The main field of study throughout the period was immunoparasitotogy.

Keywords: Articles, Biomedical Research, Co-Authorship, France, Impact, Impact Factor, Impact Factors, ISI, Journals, Research

? Wagner-Dobler, R. (2001), Rescher’s principle of decreasing marginal returns of scientific research. *Scientometrics*, **50** (3), 419-436.

Full Text: [2001\Scientometrics50, 419.pdf](2001/Scientometrics50,%20419.pdf)

Abstract: In his book “Scientific Progress”. Rescher (1978, German ed. 1982, French ed. 1993) developed a principle of decreasing marginal returns of scientific research, which is based, inter alia. on a law of logarithmic returns and on Lotka’s law in a certain interpretation. In the present paper, the historical precursors and the meaning of the principle are sketched out. It is reported on some empirical case studies concerning the principle spread over the literature. New bibliometric data are used about 19th-century mathematics and physics. They confirm Rescher’s principle apart From the early phases of the disciplines where a square root law seems to be more applicable. The implication of the principle that the returns of different quality levels grow the slower, the higher the level, is valid. However, the time-derivative ratio between (logarithmized) investment in terms of manpower and returns in terms of first-rate contributors seems not to be linear, but rather to fluctuate vividly, pointing to the cyclical nature of scientific progress. With regard to Rescher’s principle, in the light of bibliometric indicators no difference occurs between a natural science like physics and a formal science like mathematics. From mathematical progress of the 19th century, constant or increasing returns in the form of new formulas, theorems and axioms are observed, which leads to a complementary interpretation of the principle of decreasing marginal returns as a principle of scientific “mass production”.

Keywords: Bibliometric, Bibliometric Indicators, Case Studies, Law, Literature, Lotka’S Law, Mathematics, Research, Science

? Huber, J.C. and Wagner-Dobler, R. (2001), Scientific production: A statistical analysis of authors in physics, 1800-1900. *Scientometrics*, **50** (3), 437-453.

Full Text: [2001\Scientometrics50, 437.pdf](2001/Scientometrics50,%20437.pdf)

Abstract: We show that scientific production can be described by two variables: rate of production (rate of publications) and career duration. For 19(th) century physicists, we show that the time pattern of production is random and Poisson distributed, contrary to the theory of cumulative advantage. We show that the exponential distribution provides excellent goodness-of-fit to rate of production and career duration. The good fits to these distributions can be explained naturally from the statistics of exceedances. Thus, more powerful statistical tests and a better theoretical foundation is obtained for rate of production and career duration than has been the case for Lotka’s Law.

Keywords: Publications, Scientific Production, Statistics, Theory

? van Dalen, H.P. and Henkens, K. (2001), What makes a scientific article influential? The case of demographers. *Scientometrics*, **50** (3), 455-482.

Full Text: [2001\Scientometrics50, 455.pdf](2001/Scientometrics50,%20455.pdf)

Abstract: In this paper we examine, by means of a citation analysis, which factors influence the impact of articles published in demography journals between 1990 and 1992. Several quantifiable characteristics of the articles (characteristics with respect to authors, visibility, content and journals) are strongly related to their subsequent impact in the social sciences. Articles are most frequently cited when they deal with empirical, ahistorical research focusing on populations in the developed world, when they are prominently placed in a journal issue, when they are written in English and when they appear in core demography journals. Furthermore, although eminent scholars are likely to be cited on the basis of their reputation, the effect of reputation appears to be small in demography.

Keywords: Articles, Citation, Citation Analysis, Core, Impact, Journals, Origins, Research, Research Productivity, Social Sciences, Social-Science, Visibility

? Stegmann, J. and Grohmann, G. (2001), Citation rates, knowledge export and international visibility of dermatology journals listed and not listed in the Journal Citation Reports. *Scientometrics*, **50** (3), 483-502.

Full Text: [2001\Scientometrics50, 483.pdf](2001/Scientometrics50,%20483.pdf)

Abstract: Publication and citation data for the thirty journals listed in the Dermatology gr Venereal Diseases category of the 1996 edition of the Journal Citation Reports (JCR) on CDROM and seven dermatology journals not listed in the JCR-1996 were retrieved online from DIMDI and analysed with respect to short- and long-term impact factors, ratios of cited to uncited papers, as well as knowledge export and international visibility. The short-term impact factors (calculated according to the rules applied in the JCR) are very similiar to their JCR counterparts: thus there are only minor changes in the rankings according to JCR impact factors and those calculated on the basis of online data, The non-JCR journals rank within the upper (two titles) and the lower third of the 37 journals (one title being at the upper end of the last third and the other four titles being at the very end of the list). Ranking the journals according to their long-term impact factors results in no major changes of a journal’s position. Normalized mean citation rates which give a more direct impression of a journals’s citedness in relation to the average citedness of its subfield are also shown. Ratios of cited to uncited papers parallel in general the impact factors, i.e., journals with higher (constructed) impact factors have a higher percentage of cited papers. For each journal, the Gini concentration coefficient was calculated as a measure of unevenness of the citation distribution. In general, journals with higher (constructed) impact factors have higher Gini coefficients, i.e., the higher the impact factors the more uneven the citation distribution. Knowledge export and international visibility were measured by determination of the distinct categories to which the citing journals have been assigned (“citing subfields”) and of the distinct countries to which the citing authors belong (“citing countries”), respectively. Each journal exhibits a characteristic profile of citing subfields and citing countries, Normalized rankings based on knowledge export and international visibility (relating the number of published papers to the number of distinct subfields and distinct countries) are to a large extent different compared to the impact factor rankings. It is concluded that the additional data given, especially the data on knowledge export and international visibility, are necessary ingredients of a comprehensive description of a journal’s significance and its position within its subject category.

Keywords: Citation, Dermatology, Impact, Impact Factor, Impact Factors, Indicators, Journal Citation Reports, Journals, Ranking, Rankings, Scientific Journals, Visibility

Kim, M.J. (2001), A bibliometric analysis of physics publications in Korea, 1994-1998. *Scientometrics*, **50** (3), 503-521.

Full Text: [2001\Scientometrics50, 503.pdf](2001/Scientometrics50,%20503.pdf)

Abstract: This study examined research performance of Korean physicists, comparing Korean-authored papers versus internationally co-authored papers, indexed in SCI, 1994-1998, and using thenumber of citations received by internationally co-authored papers covered by the SCI CD-ROM. For the study, 4,665 papers published from the researchers affiliated with the physics departments or physics-associated laboratories at Korean universities and indexed by SCI were analyzed. Korean authored papers tended to be published in Korean, Japanese, and UK journals, while internationally co-authored papers were more likely to appear in German, Dutch, and Swiss journals. Among the 18 authorship countries (on the basis of first author), 93 internationally co-authored papers by U.S. researchers had the highest citation rate, an average 15.9 citations per paper. Of the eight countries that published over 5 papers, there was no correlation between the average number of citations per paper and the total number of citations. However, an ANOVA indicated a significant difference between the average number of citations per paper according to country (F = 5.84, p < 0.0005). In other words, papers by the U.S. and French researchers tended to be cited more frequently than papers by the Italian, Japanese, Korean, Russian, and German researchers.

Hornbostel, S. (2001), Third party funding of German universities. An indicator of research activity? *Scientometrics*, **50** (3), 523-537.

Full Text: [S\Scientometrics50, 523.pdf](S/Scientometrics50,%20523.pdf)

Abstract: This article focusses on third party funding of research in German universities. The central question is, whether funding data can function as suitable indicators for the measurement of research performance of university departments. After a brief description of the importance and the extent of third party funding in the German system of research funding, the quality of data is discussed and the funding indicator is compared with bibliometric indicators. Resultened, one can say that in subjects where external funding of research is usual, the funding indicator points to the same direction as other indicators do. Because of the peer review process involved in grant awarding, a funding indicator is in many subjects a suitable indicator to evaluate R&D impacts.

? Vinkler, P. (2001), An attempt for defining some basic categories of scientometrics and classifying the indicators of evaluative scientometrics. *Scientometrics*, **50** (3), 539-544.

Full Text: [2001\Scientometrics50, 539.pdf](2001/Scientometrics50,%20539.pdf)

Keywords: Big Scientometrics, Scientometrics

? Burrell, Q.L. (2001), Two problems posed by Egghe. *Scientometrics*, **50** (3), 545-550.

Full Text: [2001\Scientometrics50, 545.pdf](2001/Scientometrics50,%20545.pdf)

? Egghe, L. (2001), Comments on the “Letter to the Editor” by Burrell. *Scientometrics*, **50** (3), 551-552.

Full Text: [2001\Scientometrics50, 551.pdf](2001/Scientometrics50,%20551.pdf)

? Moed, H.F. (2001), Proceedings of the Sixth International Conference on Science and Technology Indicators - Introduction. *Scientometrics*, **51** (1), 5-8.

Full Text: [2001\Scientometrics51, 5.pdf](2001/Scientometrics51,%205.pdf)

Keywords: International, Science, Technology

? Amaral, L.A.N., Gopikrishnan, P., Matia, K., Plerou, V. and Stanley, H.E. (2001), Application of statistical physics methods and concepts to the study of science & technology systems. *Scientometrics*, **51** (1), 9-36.

Full Text: [2001\Scientometrics51, 9.pdf](2001/Scientometrics51,%209.pdf)

Abstract: We apply methods and concepts of statistical physics to the study of science & technology (S&T) systems. Specifically, our research is motivated by two concepts of fundamental importance in modern statistical physics: scaling and universality. We try to identify robust, universal, characteristics of the evolution of S&T systems that can provide guidance to forecasting the impact of changes in funding. We quantify the production of research in a novel fashion inspired by our previous study of the growth dynamics of business firms. We study the production of research from the point of view both of inputs (R&D funding) and of outputs (publications and patents) and find the existence of scaling laws describing the growth of these quantities. We also analyze R&D systems of different countries to test the “universality” of our results. We hypothesize that the proposed methods may be particularly useful for fields of S&T (or for levels of aggregation) for which either not enough information is available, or for which evolution is so fast that there is not enough time to collect enough data to make an informed decision.

Keywords: Alzheimer-Disease, Growth Dynamics, Impact, Indicators, Journal Impact Factors, Law, Long-Range Correlations, Patents, Publications, R&D, Rates, Research, Research Performance, Scaling Behavior, Science, Senile Plaques, Technology

? Bonitz, M. and Scharnhorst, A. (2001), Competition in science and the Matthew core journals. *Scientometrics*, **51** (1), 37-54.

Full Text: [2001\Scientometrics51, 37.pdf](2001/Scientometrics51,%2037.pdf)

Abstract: Competition is one of the most essential features of science. A new journal indicator - the “number of Matthew citations in a journal” was found that reflects certain aspects of this competition. The indicator mirrors the competition of countries in scientific journals for recognition in terms of seemingly “redistributed” citations. The indicator shows, as do other journal indicators, an extreme skewed distribution over an ensemble of 2712 SCI journals. Half of all Matthew citations are contained in 144 so-called Matthew core journals. In this paper, a new typology of scientific journals, including the Matthew core journals, is introduced. For a few selected journals, graphs are presented showing national impact factors as well as the absolute number of Matthew citations gained or lost by the countries publishing in the journal. Scientific competition among countries for recognition is strongest in the Matthew core journals, they ate the most competitive markets for scientific publications. Conclusions are drawn for national science policy, for the journal acquisition policy of national libraries, and for the publication behaviour of individual scientists.

Keywords: Citations, Competition, Core, Impact, Impact Factors, Journals, National Science, Publication, Publications, Publishing, Sci, Science, Scientific Journals, Scientific Publications

? Buter, R.K. and Noyons, E.C.M. (2001), Improving the functionality of interactive bibliometric science maps. *Scientometrics*, **51** (1), 55-68.

Full Text: [2001\Scientometrics51, 55.pdf](2001/Scientometrics51,%2055.pdf)

Abstract: The use of a map as a metaphor of a scientific field is an established idea and using it as an interface to bibliometric data seems to have great potential. Nevertheless, our own implementation of such an interface came up with some limits inhibiting the user to comprehend as to what he was looking at. As a result, the map was not used to its fullest potential. The implementation described in this paper as a high-level (conceptual) design, addresses the problems noted by users. It combines both top-down and bottom-up access to the bibliometric data, something we see as vital to mapping internal knowledge onto the external depiction and vice versa. And as such, it becomes a more complete tool to explore the mapped scientific field and to find and retrieve relevant information.

Keywords: Bibliometric, Mapping, Science

? Glänzel, W. (2001), National characteristics in international scientific co-authorship relations. *Scientometrics*, **51** (1), 69-115.

Full Text: [2001\Scientometrics51, 69.pdf](2001/Scientometrics51,%2069.pdf)

Abstract: The main objective of this study is the elaboration of national characteristics in international scientific co-authorship relations. An attempt is made to find statistical evidence of symmetry and asymmetry in co-publication links, of the relation between international co-authorship and both national research profiles and citation impact. Four basic types can be distinguished in the relative specialisation of domestic and internationally co-authored publications of 50 most active countries in 1995/96 concerning the significance of the difference between the two profiles. Co-publication maps reveal structural changes in international co-authorship links in the last decade. Besides stable links and coherent clusters, new nodes and links have also been found. Not all links between individual countries are symmetric. Specific (unidirectional) co-authorship affinity could also be detected in several countries. As expected, international co-authorship, on an average, results in publications with higher citation rates than purely domestic papers. However, the influence of international collaboration on the national citation impact varies considerably between the countries (and within one individual country between fields). In some cases there is, however, no citation advantage for one or even for both partners.

Keywords: Citation, Citation Impact, Co-Authorship, Collaboration, Impact, International Collaboration, Publications, Research

Koehler, W. (2001), Information science as ‘Little Science ‘: The implications of a bibliometric analysis of the Journal of the American Society for Information Science. *Scientometrics*, **51** (1), 117-132.

Full Text: [2001\Scientometrics51, 117.pdf](2001/Scientometrics51,%20117.pdf)

Abstract: This paper considers the status of information science as science through an exploration of one of the leading journals in the field - the Journal of the American Society for Information Science (JASIS) from its initial publication as American Documentation (AD) in 1950 through the closing issue of its Silver Anniversary year in December 1999, It is a bibliometric examination of AD, JASIS articles. Based on our analysis of articles published in AD and JASIS from 1950 to 1999, we find that there has been a slow but perhaps inevitable shift based first on the single nonfunded researcher and author to a much wider research and publishing participation among authors, regions, corporate authors, and countries. This suggests not only cross-fertilization of ideas, but also more complex research questions. A small trend toward greater external funding further reinforces this hypothesis. Information may no longer be ‘little’ science, but it is also not ‘big’ science

Keywords: Authorship, Bibliometric, Bibliometric Analysis, Citation Analysis, Cocitation, Countries, Jasis, Journals, Library, Publication, Publishing, Research, Scientific Literature, Scientometrics

Kortelainen, T.A.M. (2001), Studying the international diffusion of a national scientific journal. *Scientometrics*, **51** (1), 133-146.

Full Text: [2001\Scientometrics51, 133.pdf](2001/Scientometrics51,%20133.pdf)

Abstract: The purpose of this paper is to apply concepts of the diffusion of innovations research in the study of the international diffusion of a formerly national scientific journal, Annales Zoologici Fennici. The study was conducted using bibliometric methodology. The diffusion of the journal was described through citations of the journal and through the development of the national distribution of its contributors. The compatibility of the journal as well as the decrease of complexity were found to have an influence on diffusion. Bibliometric methods were able to represent the international diffusion of a scientific journal

Keywords: Bibliometric, Citation, Citations, Methods, Research, Scientometrics

? Mabe, M. and Amin, M. (2001), Growth dynamics of scholarly and scientific journals. *Scientometrics*, **51** (1), 147-162.

Full Text: [2001\Scientometrics51, 147.pdf](2001/Scientometrics51,%20147.pdf)

Abstract: Results are presented on journal growth dynamics at both the micro and macro levels, showing that journal development clearly follows researcher behaviour and growth characteristics. At the subject discipline level, the journal system is highly responsive to research events. Overall journal growth characteristics clearly show the predominance of 3.3% compound annual growth under a number of different socio-political climates. It is proposed that this represents a lower limit to journal growth rates and that this growth is the outcome of a self-organizing information system that reflects on the growth and specialization of knowledge. Potential models are suggested which could form attractive theoretical further lines of enquiry.

Keywords: Journals, Research, Scientific Journals, System

? Meyer, M.S. (2001), Patent citation analysis in a novel field of technology: An exploration of nano-science and nano-technology. *Scientometrics*, **51** (1), 163-183.

Full Text: [2001\Scientometrics51, 163.pdf](2001/Scientometrics51,%20163.pdf)

Abstract: This paper explores the interrelationships between science and technology in the emerging area of nano-science and technology. We track patent citation relations at the sectoral-disciplinary, the organizational, and the combined industrial/organizational levels, Then we investigate the geographic location and organizational affiliation of inventor/authors, Our main finding is that there are only a small number of citations connecting nano-patents with nano-science papers, while nano-science and technology appear to be relatively well connected in comparison with other fields. Further explorations suggest that nano-science and technology are still mostly separated spheres, even though there are overlaps, as an analysis of title words shows. Another observation is that university-assigned patents seem to cite papers more frequently than other patents.

Keywords: Citation, Citation Analysis, Citations, Nanoscience, Nanoscience and Nanotechnology, Nanotechnology, Patent, Patents, Science, Science and Technology, Technical Change, Technology

? Michel, J. and Bettels, B. (2001), Patent citation analysis - A closer look at the basic input data from patent search reports. *Scientometrics*, **51** (1), 185-201.

Full Text: [2001\Scientometrics51, 185.pdf](2001/Scientometrics51,%20185.pdf)

Abstract: The present paper focuses on some important requirements for understanding patent search reports in view of their use for statistical analysis. It is pointed out and illustrated that the comprehensiveness and the quality of a given search report may vary significantly as a function of the patent office drawing up the report. These differences imply consequences with respect to the safe use and interpretation of the data. The authors stress that a sound analysis based on patent citation data can only be performed in a meaningful way if the analyst has a minimum knowledge of the underlying search reports.

Keywords: Citation, Citation Analysis, Indicators, Patent, Science, Technology

Morillo, F., Bordons, M. and Gomez, I. (2001), An approach to interdisciplinarity bibliometric indicators. *Scientometrics*, **51** (1), 203-222.

Full Text: [2001\Scientometrics51, 203.pdf](2001/Scientometrics51,%20203.pdf)

Abstract: Interdisciplinarity has become of increasing interest in science in the past few years. This paper is a case study in the area of Chemistry, in which a series of different bibliometric indicators for measuring interdisciplinarity are presented. The following indicators are analysed: a) ISI multi- classification of journals in categories, b) patterns of citations and references outside category and c) multi- assignation of documents in Chemical Abstracts sections. Convergence between the different indicators is studied. Depending on the size of the unit analysed (area, category or journal) the most appropriate indicators are determined

Keywords: Bibliometric, Citations, Interdisciplinarity, Journals, Science, Scientometrics

? Narvaez-Berthelemot, N. and Russell, J.M. (2001), World distribution of social science journals: A view from the periphery. *Scientometrics*, **51** (1), 223-239.

Full Text: [2001\Scientometrics51, 223.pdf](2001/Scientometrics51,%20223.pdf)

Abstract: An analysis carried out on the 4.326 periodicals in the social sciences included in the most recent 1991 printed edition of the UNESCO DARE database showed that 64% of the world’s production is published by High Income Economy countries (IEC). Only 0.7% of Low IEC journals in the UNESCO database were also present in the Social Sciences Citation Index (SSCT) for the same year while corresponding figures for the Middle and High IEC were 2.3%, and 97.0%, respectively. With the notable exception of the United States, all countries had fewer journals in SSCI than in UNESCO database.

Keywords: Analysis, Database, Distribution, Journals, Periodicals, Science, Science Journals, Sciences, Social, Social Sciences, SSCI, Unesco, United States

Nederhof, A.J., Luwel, M. and Moed, H.F. (2001), Assessing the quality of scholarly journals in Linguistics: An alternative to citation-based journal impact factors. *Scientometrics*, **51** (1), 241-265.

Full Text: [2001\Scientometrics51, 241.pdf](2001/Scientometrics51,%20241.pdf)

Abstract: Methods were developed to allow quality assessment of academic research in linguistics in all sub-disciplines. Data were obtained from samples of respondents from Flanders, the Netherlands, as well as a world-wide sample, evaluated journals, publishers, and scholars. Journals and publishers were ranked by several methods. First, we weighted the number of times journals or publishers were ranked as ‘outstanding’, ‘good’. or ‘occasionally, not at all good’. To reduce the influence of unduly positive or negative biases of respondents, the most extreme ratings were trimmed. A second weight reflects the (international) visibility of journals and publishers. Here, journals or publishers nominated by respondents from various countries or samples received a greater weight than journals or publishers nominated by respondents from one country or one sample only. Thirdly, a combined index reflects both quality and international visibility. Its use is illustrated on the output of scholars in linguistics. Limitations and potentials for application of bibliometric methods in output assessments are discussed

Keywords: Behavioral- Sciences, Bibliometric, Bibliometric Indicators, Fields, Humanities, Journal Impact, Journals, Methods, Questionnaire, Research, Research Performance, Scientometrics

? Polanco, X., Francois, C. and Lamirel, J.C. (2001), Using artificial neural networks for mapping of science and technology: A multi-self-organizing-maps approach. *Scientometrics*, **51** (1), 267-292.

Full Text: [2001\Scientometrics51, 267.pdf](2001/Scientometrics51,%20267.pdf)

Abstract: We argue in favour of artificial neural networks for exploratory data analysis, clustering and mapping. We propose the Kohonen self-organizing map (SOM) for clustering and mapping according to a multi-maps extension. It is consequently called Multi-SOM. Firstly the Kohonen SOM algorithm is presented. Then the following improvements are detailed: the way of naming the clusters, the map division into logical areas, and the map generalization mechanism. The multi-map display founded on the inter-maps communication mechanism is exposed, and the notion of the viewpoint is introduced. The interest of Multi-SOM is presented for visualization, exploration or browsing, and moreover for scientific and technical information analysis. A case study in patent analysis on transgenic plants illustrates the use of the Multi-SOM. We also show that the inter-map communication mechanism provides support for watching the plants on which patented genetic technology works. It is the first map. The other four related maps provide information about the plant parts that are concerned, the target pathology, the transgenic techniques used for making these plants resistant, and finally the firms involved in genetic engineering and patenting. A method of analysis is also proposed in the use of this computer-based multi-maps environment. Finally, we discuss some critical remarks about the proposed approach at its current state. And we conclude about the advantages that it provides for a knowledge-oriented watching analysis on science and technology. In relation with this remark we introduce in conclusion the notion of knowledge indicators.

Keywords: Data Analysis, Mapping, Mechanism, Patent, Patent Analysis, Science, Science And Technology, Technology

? Rinia, E.J., van Leeuwen, T.N., Bruins, E.E.W., van Vuren, H.G. and van Raan, A.F.J. (2001), Citation delay in interdisciplinary knowledge exchange. *Scientometrics*, **51** (1), 293-309.

Full Text: [2001\Scientometrics51, 293.pdf](2001/Scientometrics51,%20293.pdf)

Abstract: As part of a larger project to investigate knowledge flows between fields of science, we studied the differences in speed of knowledge transfer within and across disciplines. The age distribution of references in three selections of articles was analysed, including almost 800,000 references in journal publications of the United Kingdom in 1992, 700,000 references in publications of Germany in 1992, and more than 11 million references in the world total of publications in 1998. The rate of citing documented knowledge from other disciplines appears to differ sharply among disciplines. For most of the disciplines the same ratio’s are found in the three data sets. Exceptions show interesting differences in the interdisciplinary nature of a field in a country. We find a general tendency of a citation delay in case of knowledge transfer between different fields of science: citations to work of the own discipline show less of a time lag than citations to work in a foreign discipline. Between disciplines typical differences in the speed of incorporating knowledge from other disciplines are observed, which appear to be relatively independent of time and place: for each discipline the same pattern is found in the three data sets. The discipline specific characteristics found in the speed of interdisciplinary knowledge transfer may be point of departure for further investigations. Results may contribute to explanations of differences in citation rates of interdisciplinary research.

Keywords: Articles, Citation, Citations, Publication Delays, Publications, Research, Science, Scientific Literature, United Kingdom

? Schwechheimer, H. and Winterhager, M. (2001), Mapping interdisciplinary research fronts in neuroscience: A bibliometric view to retrograde amnesia. *Scientometrics*, **51** (1), 311-318.

Full Text: [2001\Scientometrics51, 311.pdf](2001/Scientometrics51,%20311.pdf)

Abstract: The neoroscience research front on Retrograde Amnesia is taken as an example to demonstrate the capabilities of co-citation mapping in combination with peer review. In an interview with a well-known expert in the field the co-citation map was confirmed as a good representation of the speciality. The expert was able to identify and comment on different regions of the map and he could validate important documents in the cluster core and research front as well as the main actors on institutional and national level. The bibliometric data inspired the expert to outline the cognitive and social ‘history’ of the speciality.

? Thomas, P. (2001), A relationship between technology indicators and stock market performance. *Scientometrics*, **51** (1), 319-333.

Full Text: [2001\Scientometrics51, 319.pdf](2001/Scientometrics51,%20319.pdf)

Abstract: One of the main objectives of technology analyses is to understand how investing in technological innovation can have commercial benefits. However, empirical studies of the relationship between investments in technology and subsequent economic performance are relatively scarce. This paper provides such an analysis by demonstrating how quantitative R&D and technology indicators may be used to forecast company stock price performance. The purpose of the analysis is to utilize a unique patent database, and the science and technology indicators developed from the data therein, to explore this issue of technological competence and economic performance. The underlying concept behind this study is that the quality of a company’s technology is reflected in its patent portfolio. Previous research has shown that a company with a large percentage of influential parents is much more likely to be technologically successful than a company with weaker patents. The analysis presented here reveals that such a company is also more likely to be successful in capital markets.

Keywords: Database, Output, Patent, Patents, R&D, R-And-D, Research, Science, Science and Technology, Technological Innovation, Technology

Van Leeuwen, T.N., Moed, H.F., Tijssen, R.J.W., Visser, M.S. and Van Raan, A.F.J. (2001), Language biases in the coverage of the Science Citation Index and its consequences for international comparisons of national research performance. *Scientometrics*, **51** (1), 335-346.

Full Text: [2001\Scientometrics51, 335.pdf](2001/Scientometrics51,%20335.pdf)

Abstract: Empirical evidence presented in this paper shows that the utmost care must be taken ininterpreting bibliometric data in a comparative evaluation of national research systems. From the results of recent studies, the authors conclude that the value of impact indicators of research activities at the level of an institution or a country strongly depend upon whether one includes or excludes research publications in SCI covered journals written in other languages than in English. Additional material was gathered to show the distribution of SCI papers among publication languages. Finally, the authors make suggestions for further research on how to deal with this type of problems in future national research performance studies.

? van Raan, A.F.J. (2001), Competition amongst scientists for publication status: Toward a model of scientific publication and citation distributions. *Scientometrics*, **51** (1), 347-357.

Full Text: [2001\Scientometrics51, 347.pdf](2001/Scientometrics51,%20347.pdf)

Abstract: We present a model in which scientists compete with each other in order to acquire status for their publications in a two-step-process: first, to get their work published in better journals, and second, to get this work cited in these journals. On the basis of two Maxwell-Boltzmann type distribution functions of source publications we derive a distribution function of citing publications over source publications. This distribution function corresponds very well to the empirical data. In contrast to all observations so far, we conclude that this distribution of citations over publications, which is a crucial phenomenon in scientometrics. is not a power law, but a modified Bessel-function.

Keywords: Citation, Citations, Journals, Publication, Publications, Science, Scientific Publication, Scientometrics

? Grupp, H., Schmoch, U. and Hinze, S. (2001), International alignment and scientific regard as macro-indicators for international comparisons of publications. *Scientometrics*, **51** (2), 359-380.

Full Text: [2001\Scientometrics51, 359.pdf](2001/Scientometrics51,%20359.pdf)

Abstract: Many international comparisons of the publication performance at the macro level are based on direct counts of citation frequencies in the Science Citation Index. However, these comparisons may reveal a significant negative language bias for non-English-speaking countries, or other selection biases, which can be illustrated by the relation between research budgets of scientific institutions and SCI publications. Against this background, a two-dimensional representation, specifying for the international alignment of the national publications and the journal-standardized citation impact, proves to be a more appropriate indicator base to assess the citation performance of countries such as Germany. In the light of a ten countries’ benchmark, time series of these indicators for the nineties show a considerable impact of the German unification with a recent trend towards an adaptation of publication behaviour in East Germany towards the Western patterns.

Keywords: Citation, Citation Impact, Impact, International, Publication, Publications, Research, Sci, Science, Science Citation Index

? Koljatic, M. and Silva, M. (2001), The international publication productivity of Latin American countries in the economics and business administration fields. *Scientometrics*, **51** (2), 381-394.

Full Text: [2001\Scientometrics51, 381.pdf](2001/Scientometrics51,%20381.pdf)

Abstract: The present study compares the international publication productivity of Latin American countries in the fields of business administration and economics from 1995 to 1999. Only four countries - Argentina, Brazil, Chile, and Mexico - have a substantial research production in these areas. Among these countries, Chile showed the most favorable results according to various indicators of publication productivity.

Keywords: Authorship, Behavioral-Sciences, Citation Analysis, Indicators, Journals, Management, Mexico, Patterns, Publication, Publication Productivity, Research, Research Production, Scientists, Social-Sciences, Subfields

? de Marchi, M. and Rocchi, M. (2001), The editorial policies of scientific journals: Testing an impact factor model. *Scientometrics*, **51** (2), 395-404.

Full Text: [2001\Scientometrics51, 395.pdf](2001/Scientometrics51,%20395.pdf)

Abstract: There is an evident need for the most scrupulous assessment possible of the fruits of research tin the context considered here, namely, publications) with a qualitative hence in-depth analysis of the single products of R&D. But this would require time and competences which not all policy makers have at their disposal. Hopefully, quantitative procedures, apparently objective and easy to apply, would be able to surmount these difficulties. The diffusion of the quantitative evaluation of research is, that is, the policy makers’ adaptive response to the need to increase controls of the efficiency of public spending in R&D - since public investment clearly could not be determined at the outset on the basis of the market’s spontaneous, decentralised balancing mechanisms. An essential step towards the prevention of the distortions most likely to result from quantitative evaluation is the adoption of quantitative procedures of evaluation of the editorial policies of scientific journals - or, rather, of journals which claim to be scientific. Such procedures must be designed to highlight any distortions caused by the non-optimal editorial policies of journals. With quantitative evaluation, in fact, journals play a crucial role in the formation of public science policies. They thus have to be subjected to specific monitoring to make sure that their conduct fits in with the prerequisites necessary for them to perform their semi-official activity as certifiers of the quality of the products of research. The phenomena of the production, divulgation and fruition of scientific discovery are, of course, so complex that it is necessary to weigh them not with a single indicator, however helpful it may be, but with a constellation of indicators. We received confirmation of the reliability of the impact factor as an instrument to monitor the quality of research and as a means of evaluating the research itself. This is a reassuring result for the current formulation of public policies and confirms the substantial honesty of the competition mechanisms of the scientific enterprise.

Keywords: Assessment, Citation Counts, Competition, Complex, Diffusion, Editorial Policies, Evaluation, Fruits, Impact, Impact Factor, Indicators, Journals, Mechanisms, Publications, R&D, Research, Science, Scientific Journals

? Sutter, M. and Kocher, M.G. (2001), Power laws of research output. Evidence for journals of economics. *Scientometrics*, **51** (2), 405-414.

Full Text: [2001\Scientometrics51, 405.pdf](2001/Scientometrics51,%20405.pdf)

Abstract: In this paper we examine the validity of Lotka’s law and Zipf’s law for research output in 15 top journals of economics in the period 1977 to 1997. Our data for individual authors satisfy a general form of Lotka’s law. We find increasing competition over time among economists on the individual level. However, publications in top journals are concentrated heavily when the institutional level is under consideration. Research output of institutions can be fit adequately by Zipf’s law.

Keywords: Competition, Core Journals, Journals, Lotka’S Law, Publications, Relative Impacts, Research, Research Output

? Garg, K.C. and Padhi, P. (2001), A study of collaboration in laser science and technology. *Scientometrics*, **51** (2), 415-427.

Full Text: [2001\Scientometrics51, 415.pdf](2001/Scientometrics51,%20415.pdf)

Abstract: An analysis of 3174 papers published in journals in the field of laser science and technology indicate that only 401 papers were single authored and the rest 2773 were co-authored papers. Of the 2773 papers, only 687 were written in local (inter-departmental), domestic (inter-institutional) and international collaboration. As reflected by the values of collaborative coefficient and coauthorship index, it is observed that the proportion of mega-authored papers for Japan, France, Italy, and the Netherlands was more, while for Canada, China, and Australia the proportion of single authored papers was more. Most of the collaborative papers had bilateral domestic and international collaboration. Domestic collaborations were higher for USA, Japan, France and Australia, while international collaboration was higher for China, Israel, the Netherlands, and Switzerland.

Keywords: China, Collaboration, France, International Collaboration, International Scientific Collaboration, Journals, Population-Genetics Speciality, Science, Science And Technology, Scientometrics, Technology, Usa

? Genest, C. and Thibault, C. (2001), Investigating the concentration within a research community using joint publications and co-authorship via intermediaries. *Scientometrics*, **51** (2), 429-440.

Full Text: [2001\Scientometrics51, 429.pdf](2001/Scientometrics51,%20429.pdf)

Abstract: Given extensive research collaboration in modem science, both at the national and international level, one might wonder whether the network of researchers within each discipline is now sufficiently meshed that a large proportion of contributors to peer-reviewed journals in a given field could either share joint publications or, more realistically, be connected through chains of co-authorships. Such is not the case yet in the fields of probability and statistics, however, as shown here using a large data base covering 9 reknown journals from each of these two areas over the period 1986-1995.

Keywords: Co-Authorship, Coauthorship Networks, Collaboration, Data Base, International Scientific Collaboration, Invisible-Colleges, Journals, Patterns, Probability, Publications, Research, Research Collaboration, Researchers, Science, Statistics

? Van den Besselaar, P. (2001), The cognitive and the social structure of STS. *Scientometrics*, **51** (2), 441-460.

Full Text: [2001\Scientometrics51, 441.pdf](2001/Scientometrics51,%20441.pdf)

Abstract: The differentiation of scientific fields into sub-fields can be studied on the level of the ‘scientific content’ of the sub-field, that is on the level of the products, as well as on the level of the ‘social structures’ of the sub-field, that is on the lever of the producers of the content. By comparing the behavior of the constructs with the behavior of the constructors, we are able to demonstrate the analytical distinction between a cognitive and a social approach in an empirical way. This will be illustrated using the case of integration and differentiation in Science and Technology Studies (STS), Elsewhere, using relations between documents, I showed how STS is characterized by strong differentiation tendencies. In this paper I address the question to what extent this differentiation is also reflected in the social structure of the STS field. Can STS scholars and STS research groups be classified in terms of the sub-fields? Or do researchers and institutes carry an integrative role in the STS field? Are the relations between the sub-fields of STS maintained by individual researchers or research institutes, and to what extent? The analysis in this paper reveals that this is generally not the case. Although we are able to distinguish analytically between the cognitive and social dimension of the development of the research field, we find similar patterns of differentiation an the social level too. At the same time, this differentiation differs in some respects from the cognitive differentiation pattern. Consequently, the social and the cognitive dimensions of the STS field are not independent as no serious STS scholar would argue - but also not identical, as radical constructivists claim, but are strongly interacting Further analysis may reveal the leading dynamics, that is answering the question whether the ‘social’ follows the ‘cognitive’, the other way around, or whether the dynamics has the pattern of ‘co-evolution’.

Keywords: Groups, Integration, Research, Researchers, Science, Technology

? Mccain, K.W. (2001), Dr. Belver C. Grittith - Introduction. *Scientometrics*, **51** (3), 465-467.

Full Text: [2001\Scientometrics51, 465.pdf](2001/Scientometrics51,%20465.pdf)

? Moyer, L.J. (2001), Bibliography of publications of Belver C. Griffith. *Scientometrics*, **51** (3), 469-479.

Full Text: [2001\Scientometrics51, 469.pdf](2001/Scientometrics51,%20469.pdf)

Keywords: Publications

? Chu, H.T. (2001), Intellectual activities and influences of Belver C. Griffith: A citation perspective. *Scientometrics*, **51** (3), 481-488.

Full Text: [2001\Scientometrics51, 481.pdf](2001/Scientometrics51,%20481.pdf)

Abstract: Based on an analysis of the 377 documents that cited Griffith’s publications in the ISI citation databases, it has been found that Griffith made pioneer and significant contributions with his collaborators to the fields of bibliometrics and scholarly communication among scientists. His research work has also greatly influenced people from all over the world conducting research in psychology, bibliometric information science, and social studies of science in the past several decades.

Keywords: Bibliometric, Bibliometrics, Citation, Publications, Research, Scholarly Communication

? Small, H. (2001), Belver and Henry. *Scientometrics*, **51** (3), 489-497

Full Text: [2001\Scientometrics51, 489.pdf](2001/Scientometrics51,%20489.pdf)

Keywords: Co-Citation, Science, Scientific Literatures

Braun, T., Glänzel, W. and Schubert, A. (2001), Publication and cooperation patterns of the authors of neuroscience journals. *Scientometrics*, **51** (3), 499-510.

Full Text: [2001\Scientometrics51, 499.pdf](2001/Scientometrics51,%20499.pdf)

Abstract: Characteristics of publication activity and co-authorship in neurosciences are analysed. The present study aims at describing the common, as well as the distinguishing features of productivity and co-publication patterns of four types of authors. For this purpose, authors are classified according to their anterior and posterior records. The role of the author types in the process of documented scientific communication, the relation between co-authorship and publication activity, as well as collaboration between the four types is studied.

? Koenig, M.E.D. (2001), Lessons from the study of scholarly communication for the new information era. *Scientometrics*, **51** (3), 511-523.

Full Text: [2001\Scientometrics51, 511.pdf](2001/Scientometrics51,%20511.pdf)

Abstract: The rich body of literature examining communications flow in the research context, an area where Professor Belver Griffith made major contributions, has very direct relevance to the relatively newly emerging recognition in the business community of the importance of knowledge creation and deployment to the competitive performance of an organization. This essay examines and delineates some of those lessons, specifically the tension between open and rich communications versus the need to protect intellectual property, the importance of environmental awareness and serendipity, and achieving the correct balance with efficient use of information searching time, the importance of end-user training, and crafting the balance in knowledge management between codifications and personalization.

Keywords: Knowledge, Literature, Productivity, Research, Research Performance, Scholarly Communication, Services, Training

Kreuzman, H. (2001), A co-citation analysis of representative authors in philosophy: Examining the relationship between epistemologists and philosophers of science. *Scientometrics*, **51** (3), 525-539.

Full Text: [2001\Scientometrics51, 525.pdf](2001/Scientometrics51,%20525.pdf)

Abstract: The relation between philosophy of science and epistemology is studied using the author co-citation technique. Co-citation links among 62 authors - a representative list of various styles and approaches to rationality - were established using the Arts and Humanities Citation Index. Multidimensional scaling results in a two-dimensional map of authors, where the axes represent the subject (philosophy of science to epistemology) and the method (qualitative to quantitative), respectively. The authors on the map can be clustered into more or less coherent groups at different levels of resolution.

? Markusova, V., Minin, V., Libkind, A. and Arapov, M. (2001), Russian grant-holders opinion on competitive funding: Results of a survey. *Scientometrics*, **51** (3), 541-551.

Full Text: [2001\Scientometrics51, 541.pdf](2001/Scientometrics51,%20541.pdf)

Abstract: This paper describes results of a survey conducted among the Russian Foundation for Basic Research (RFBR) grant-holders. The aim of this paper is to examine the attitude of grant holders to new multi-channel funding system and to assess its significance for Russian scientists involved in research in natural and applied sciences. It is a first attempt to get a fair and general picture of what scientists think about competitive funding. In 1999, 1440 questionnaires were distributed by mail. The response rate was 31.8%. The results of the survey clearly show that proposal writing has become a substantial part of research activity in Russia. Each respondent received more than 5 grants during 1993-1997. The RFBR and foreign funding agencies, particularly ISF, INTAS, and the Civilian Research and Development Foundation equally evaluated Russian scientists’ performance: about 69.% of RFBR grant-holders were awarded a grant from foreign agencies. The present findings are being used, as a practical matter, to guide and inform the Ministry of Science and Technology Policy which is responsible for the promotion R&D in Russia to organize a special training for students and post does on proposal writing.

Keywords: R&D, Research, Science, System, Technology, Training

? Meadows, J. (2001), Early reactions to information growth. *Scientometrics*, **51** (3), 553-561.

Full Text: [2001\Scientometrics51, 553.pdf](2001/Scientometrics51,%20553.pdf)

Abstract: The expansion in the number of journals being published really took off in the nineteenth century. Between the beginning and end of that century, the problems of dealing with the spread of literature appearing consequently grew rapidly. The reactions of scientists to this included a move towards increasing specialisation in their research, and a higher level of organisation of their communication activities. Li particular, ways of assisting information retrieval were developed then which became extremely important in the twentieth century. Two of these developments are examined here - the provision of abstracts for scientists and of popular articles for non-scientists. Parallels can be found between these two activities, as well as differences due to the different target audiences. It is noted that both appeared in print environment: an electronic environment may affect their futures differently.

Keywords: Articles, Information Retrieval, Journals, Literature, Research

? Old, L.J. (2001), Utilizing spatial information systems for non-spatial-data analysis. *Scientometrics*, **51** (3), 563-571.

Full Text: [2001\Scientometrics51, 563.pdf](2001/Scientometrics51,%20563.pdf)

Abstract: Recent advances in the power and capabilities of personal computers have brought the algorithms and representational methods of Geographic Information Systems (GIS) to the desktop. Information that has relationships between elements may be represented spatially, especially if some distance metric can be brought to bear. This paper discusses information cartography, the use of spatial methods for the display of non-Geographic data.

Keywords: GIS, Science

? Sandstrom, P.E. (2001), Scholarly communication as a socioecological system. *Scientometrics*, **51** (3), 573-605.

Full Text: [2001\Scientometrics51, 573.pdf](2001/Scientometrics51,%20573.pdf)

Abstract: Among Belver C. Griffith’s many contributions to disciplinary communication is the idea that science and scholarship at large constitute a social system to be investigated empirically. This paper reports findings of an author co-citation analysis of the field of human behavioral ecology that expands Griffith’s concept of the social system of scientific communication to fit a socioecological framework. Cluster analysis and multidimensional scaling techniques are used to characterize the research specialty at large and portray five respondents’ individual resource maps. The techniques reveal co-citation relationships among authors whose work they had referenced in recent articles. Survey data on searching and handling behaviors for an aggregated sample of 180 cited references are correlated with core-periphery zones of the individual maps. Findings that types of socially mediated communication and distinctive information foraging behaviors correlate with different zones of a bibliographic microhabitat support an interpretation that active specialty members conform to foraging efficiency principles as predicted by prey-choice models from optimal foraging theory.

Keywords: Articles, Author Co-Citation Analysis, Author Cocitation, Co-Citation, Documents, Human Behavioral Ecology, Information-Seeking, Intellectual Structure, Research, Retrieval, Scholarly Communication, Scholarship, Science, Scientific Communication, Scientific Literatures, Space, System, Theory

? White, H.D. (2001), Author-centered bibliometrics through CAMEOs: Characterizations automatically made and edited online. *Scientometrics*, **51** (3), 607-637.

Full Text: [2001\Scientometrics51, 607.pdf](2001/Scientometrics51,%20607.pdf)

Abstract: This article describes ways of automatically generating 15 kinds of personal profiles of authors from bibliographic data on their publications in databases. Nicknamed CAMEOs, the profiles can be used for retrieval of documents by human searchers or computerized agents. They can also be used for mapping an author’s subject matter (in terms of descriptors, identifiers, and natural language) and studying his or her publishing career. Finally, they can be used to map the intellectual and social networks evident in citations to and from authors and in co-authorships.

Keywords: Bibliometrics, Citation Analysis, Citations, Databases, Mapping, Model, Publications, Publishing, Retrieval

Burrel, Q.L. (2001), Stochastic modelling of the first-citation distribution. *Scientometrics*, **52** (1), 3-12.

Full Text: [2001\Scientometrics52, 3.pdf](2001/Scientometrics52,%203.pdf)

Abstract: A simple stochastic model, based upon mixtures of non-homogeneous Poisson processes, is proposed to describe the citation process in the presence of ageing/obsolescence. Particular emphasis is placed upon investigation of the first-citation distribution where it is shown that in the presence of ageing there will inevitably be nevercited items. Conditions are given which show how the model is capable of modelling the various shapes of firstcitation distributions reported in the literature. In particular, the essential link between the firstcitation distribution and the obsolescence distribution is established.

Arunachalam, S. and Balaji, J. (2001), Fish science research in China: How does it compare with fish research in India? *Scientometrics*, **52** (1), 13-28.

Full Text: [2001\Scientometrics52, 13.pdf](2001/Scientometrics52,%2013.pdf)

Abstract: Fish and aquaculture research in the People’s Republic of China over the six years 1994-1999 has been mapped using data from six databases – three abstracting services and three citation indexes. The results are compared with fish science research in India. During the six years China has published 2035 papers (roughly 4.5 –5% of the world output) and India 2454. More than 95% of China’s papers are journal articles, compared to 82.8% of Indian papers. About 78% of China’s journal paper output has appeared in 143 domestic journals compared to 70% from India in 113 Indian journals. Less than one-eighth of the journal articles published by Chinese researchers are published in journals indexed in SCI, compared to 30% of journal articles by Indian researchers. Less than a dozen papers from each of these countries have appeared in journals of impact factor greater than 3.0. Fish research institutes and fishery colleges are the major contributors of the Chinese research output in this area. In India academic institutions are the leading contributors (61%), followed by central government institutions (>25%). Qingdao, Wuhan, Beijing and Shanghai are the cities and Shandong, Hubei and Fujian are the provinces contributing a large number of papers. As we do not have addresses of all authors in most of the papers, we are unable to estimate the extent of international collaboration. Although China’s research output and its citation impact are less than those of India, China’s fish production and export earnings are far higher than those of India. Probably China is better at bridging the gap between knowhow (research) and do-how (technology and creation of employment and wealth). China is pretty strong in extension.

Lewison, G. (2001), The quantity and quality of female researchers: A bibliometric study of Iceland. *Scientometrics*, **52** (1), 29-43.

Full Text: [2001\Scientometrics52, 29.pdf](2001/Scientometrics52,%2029.pdf)

Abstract: The output of female researchers in Iceland, relative to that of males, can be investigated because typically their ‘surnames’ end in ‘dottir’ whereas the names of males end in ‘son’. Over the 21 years from 1980 to 2000, there has been a rise in female: male output from 8% to about 30%. It is higher in the life sciences (biomedical research, biology and clinical medicine) but lower where there is also foreign co-authorship, suggesting that females are less able to make overseas contacts through travel. There appears to be no difference in the quality of female and male research output, as measured either by journal impact categories or by citations.

Keywords: Citations, Europe, Research, Science, Sexism, Women

Ugolini, D., Cimmino, M.A., Casilli, C. and Mela, G.S. (2001), How the European Union writes about ophthalmology. *Scientometrics*, **52** (1), 45-58.

Full Text: [2001\Scientometrics52, 45.pdf](2001/Scientometrics52,%2045.pdf)

Abstract: This study evaluates the distribution of papers published by European Union (EU) authors in ophthalmological journals from 1995 to 1997. The impact of ophthalmological research in the EU is compared with that produced in other countries and trends of research are highlighted through the keywords analysis. Data of articles published in ophthalmological journals (ISI Subject Category) were downloaded. Mean Impact Factor, source country population and gross domestic product were analyzed. A special purpose software for keyword elaboration was utilized. 11, 219 papers were published in the world in the ophthalmological journals: 34.8% came from the EU (UK, Germany, France, Italy and the Netherlands ranking at the top) and 40.7% from the US. The mean Impact Factor of EU papers was 0.8 in comparison with 1.5 in the US. Despite the limitations of the existing methods, bibliometric findings are useful for the monitoring of research trends. The keywords analysis shows that the leading fields of research were retinal pathologies for diseases and keratoplasty for surgical procedures. It also suggests that keywords are overused, and urges minimization of this as well as standardization among journal editors

Keywords: Bibliometric, Countries, Impact, Indicators, Journals, Methods, Publications, Research, Research Performance, Science, Tools

Marx, W., Schier, H. and Wanitschek, M. (2001), Citation analysis using online databases: Feasibilities and shortcomings. *Scientometrics*, **52** (1), 59-82.

Full Text: [2001\Scientometrics52, 59.pdf](2001/Scientometrics52,%2059.pdf)

Abstract: Extensive citation analysis with the Science Citation Index (SCI) has become possible through expanded search capabilities introduced by STN International a few years ago. STN enhanced its retrieval language with some important features, originally developed for statistical analysis of patents. Most important are an expanded select command and several functions to list the search results. The publications to be evaluated may be selected either in the SCI, or in a number of other bibliographic databases offered by the host. With the help of these features, the basic methods to appropriately measure the impact of scientific activities are demonstrated. Furthermore, possible shortcomings as well as the risks when interpreting the results of such studies are discussed.

Keywords: Fullerene Research

? Szydlowski, M. and Krawiec, A. (2001), Scientific cycle model with delay. *Scientometrics*, **52** (1), 83-95.

Full Text: [2001\Scientometrics52, 83.pdf](2001/Scientometrics52,%2083.pdf)

Abstract: In this paper we analyse the growth in scientific results of natural sciences in terms of infinite dynamical system theory. We use functional differential equations to model the evolution of science in its sociological aspect. Our model includes the time-to-build of fundamental notions in science (time required to understand them). We show that the delay parameter describing time required to learn and to apply past scientific results to new discoveries plays a crucial role in generating cyclic behaviour via the Hopf bifurcation scenario. Our model extends the de Solla Price model by including death of results as well as by incorporating the time-to-build notion. We also discuss the concepts of knowledge and its accumulation used in economic growth theory.

Keywords: Growth, Science, System, Theory

Braun, T. (2001), Vassily Vassilievich Nalimov. *Scientometrics*, **52** (2), 101.

Full Text: [S\Scientometrics52, 101.pdf](S/Scientometrics52,%20101.pdf)

? Nalimov, V.V. (2001), V. V. Nalimov’s foreword to the hungarian edition. *Scientometrics*, **52** (2), 102-104.

Full Text: [2001\Scientometrics52, 102.pdf](2001/Scientometrics52,%20102.pdf)

? Bonitz, M. (2001), About the Nalimov memorial issue of the journal Scientometrics - Guest editor’s foreword. *Scientometrics*, **52** (2), 107-109

Full Text: [2001\Scientometrics52, 107.pdf](2001/Scientometrics52,%20107.pdf)

Keywords: Scientometrics

Gurjeva, L.G. and Wouters, P. (2001), Scientometrics in the context of probabilistic philosophy. *Scientometrics*, **52** (2), 111-126.

Full Text: [2001\Scientometrics52, 111.pdf](2001/Scientometrics52,%20111.pdf)

Abstract: Although the word ‘naukometriya’ (first translated as sciencemetrics) was coined by V. V, Nalimov (1910-1997) in 1969, this field was not his main concern In the work of this multifaceted and intriguing scientist and scholar, scientometrics was only of central concern for a short period of time. Nevertheless, it is no coincidence that Nalimov is regarded as one of the founding fathers of scientometrics. In this article, we discuss the development of Nalimov’s style of scientometric research within the context of his distinctive approach to the sciences, social sciences and humanities in their entirety: his probabilistic philosophy of science and the world.

Keywords: Research

Granovsky, Y.V. (2001), Is it possible to measure science? V. V. Nalimov’s research in scientometrics. *Scientometrics*, **52** (2), 127-150.

Full Text: [2001\Scientometrics52, 127.pdf](2001/Scientometrics52,%20127.pdf)

Abstract: This article is devoted to. the scientometric research of Professor V. V, Nalimov (1910-1997) of Moscow State University, His first scientometric article was published in 1959: mathematical models of world science growth were examined and logical grounds for the applicability of these models were also given, In his further works, V.V. Nalimov continued to stress the importance of quantitative studies of science development. In 1969, the monograph on scientometrics by V. V. Nalimov and his co-author Z. M. Mulchenko was published. This book reflected his earlier publications on scientometrics and the solutions of new tasks. In 1970, Nalimov published articles on the comparison of science and the biosphere, the geographic distribution of scientific information, and changes in the demand of scientific staff. In later articles in philosophy of science, he stressed the necessity of a combination of the scientometric approach with works on the logic of science development. One of the latest works by Nalimov was an analysis of articles published by The Journal of Transpersonal Psychology: Here the scientometric approach was used to study the origin and development of a new scientific branch.

? Markova, E.V. (2001), He brought new meanings and new solutions. *Scientometrics*, **52** (2), 151-158.

Full Text: [2001\Scientometrics52, 151.pdf](2001/Scientometrics52,%20151.pdf)

Abstract The name of Vassily Vassilievich Nalimov is connected not only with the development of scientometrics, but also with the development of several other scientific branches such as metrology of quantitative chemical analysis, chemical cybernetics, mathematical theory of experiment, philosophy of science, probabilistic theory of meanings among others. All these different scientific subjects were united on the basis of a probabilistic approach as opposed to a deterministic one.

The paper covers two decades (1961–1981) of Nalimov’s life and describes the “cybernetic” period of his activity in the Scientific Council for Cybernetics in the Presidium of the USSR Academy of Sciences as a chairman of two section — “Chemical Cybernetics” and “Mathematical Theory of Experiment”

The author was the closest colleague of Nalimov in the Council. The paper touches on the peculiarities of scientific life of that time in soviet Russia, as well as the difficulties of dealing with an attempt to reorganize the higher education system. Nalimov paid special attention to this problem. The mathematical theory of experiment and scientometrics, both of which later became independent scientific branches, came from the section of “Chemical Cybernetics”.

Nalimov was a gifted pedagogue and a brilliant speaker, with an ability to enthrall the audience. Some vivid episodes related to his talks are presented in the paper.

The informal scientific community, united by ideas and world outlook, was known in our country as “Nalimov’s invisible college”. Such a community could be treated as a pioneer in the history of Russian science.

? Chernyi, A.I. and Gilyarevskii, R.S. (2001), The impact of V.V. Nalimov on information science. *Scientometrics*, **52** (2), 159-163.

Full Text: [2001\Scientometrics52, 159.pdf](2001/Scientometrics52,%20159.pdf)

Abstract: The paper briefly outlines the contributions made by VN. Nalimov to the development of science of science, scientometrics, and information science, especially during his career in VINTI. It also brings attention to his main achievements in philosophy, linguistics, and other branches of modem science.

Keywords: impact/information science/science/scientometrics

? Garfield, E. (2001), Reminiscences of Vassily V. Nalimov. *Scientometrics*, **52** (2), 165-166.

Full Text: [2001\Scientometrics52, 165.pdf](2001/Scientometrics52,%20165.pdf)

? Roy, R. (2001), Vassily Nalimov - Modern Russian high priest. *Scientometrics*, **52** (2), 167-169.

Full Text: [2001\Scientometrics52, 167.pdf](2001/Scientometrics52,%20167.pdf)

? Nalimov, V.V. (2001), Citation Classics of V. V. Nalimov. 1. Current Contents, Number 21, May 21, 1990. *Scientometrics*, **52** (2), 171-174.

Full Text: [2001\Scientometrics52, 171.pdf](2001/Scientometrics52,%20171.pdf)

Keywords: Citation

? (2001), Citation Classics of V. V. Nalimov 2. Current Contents, Number 24, June 11, 1990. *Scientometrics*, **52** (2), 175-177.

Full Text: [2001\Scientometrics52, 175.pdf](2001/Scientometrics52,%20175.pdf)

Keywords: Citation

? (2001), Facing the mystery: A philosophical approach - Nalimov Vassily Vassilievich. *Scientometrics*, **52** (2), 179-184.

Full Text: [2001\Scientometrics52, 179.pdf](2001/Scientometrics52,%20179.pdf)

? Nalimov, V.V. (2001), Philosophy of Number: How metrical hermeneutics is possible. *Scientometrics*, **52** (2), 185-192.

Full Text: [2001\Scientometrics52, 185.pdf](2001/Scientometrics52,%20185.pdf)

? Stefaniak, B. (2001), International co-operation in science and in social sciences as reflected in multinational papers indexed in SCI and SSCI. *Scientometrics*, **52** (2), 193-210.

Full Text: [2001\Scientometrics52, 193.pdf](2001/Scientometrics52,%20193.pdf)

Abstract: The paper presents a comparative analysis of publications, co-authored by Polish and foreign researchers, selected from seven annual files of Science Citation Index and Social Sciences Citation Index (CD-ROM Editions 1992-1998). Information obtained from SCI and SSCI were elaborated, completed, coded and entered in two-international files” designed for analytical purposes. It was found that the number of internationally co-authored papers was many times higher (18 982 records) in science than in social sciences (342 records). The share of these “international papers” in the “Polish files” increased in the time under review, but for those derived from SCI was also higher (39.1-46.0%) than in case of SSCI (22.4-37.0%). Results of the analysis include countries of foreign partners and affiliation of domestic coauthors, as well as, subject structure of both international files. Observed differences in the scale of international co-operation in science and in social sciences are being the matter under discussion.

Keywords: Affiliation, Analysis, CD-ROM, Cooperation, International, International Co-Operation, International Cooperation, Papers, Publications, Records, Review, Scale, SCI, Science, Science Citation Index, Sciences, Social, Social Sciences, SSCI, Structure

? Skalska-Zlat, M. (2001), Nalimov and the Polish way towards science of science - Vassily V. Nalimov. *Scientometrics*, **52** (2), 211-223.

Full Text: [2001\Scientometrics52, 211.pdf](2001/Scientometrics52,%20211.pdf)

Abstract: Nalimov’s relations with Polish scientists date from the sixties. He was present in Polish science owing to his publication - also specially prepared for Polish journals - and for his participation in Polish-Soviet science of science conferences organized alternately in Poland and in (of that time) Soviet Union. He had a high opinion - which he many times expressed - on contemporary condition of Polish science of science as well as on its previous achievements. In such opinion he was riot isolated, also John Bernal and Derek de Solla Price referred in their papers to precursory statements of Maria and Stanislaw Ossowski formulating already in the thirties of XX century progressive programme for science of science research. Ten years earlier a similar views upon science presented world-famous Polish sociologist Florian Znaniecki. So, in the first part of the paper a common way of thinking and approaching science of science basic problems in Ossowski’s, Znaniecki’s and Nalimov’s works is presented. In the second part the direct contacts of Nalimov with Polish science of science researchers widely described and commentated in Polish journals are discussed. At least using citation analysis the influence of Nalimov’s ideas on science of science and scientometrics in Poland is presented. As a base to citation analysis the journal Problems of the Science of Science (1965-1999) and monographs devoted to scientometrics, bibliometrics and informetrics were taken.

Keywords: Bibliometrics, Citation, Citation Analysis, Informetrics, Journals, Publication, Research, Researchers, Science, Science of Science, Scientometrics

? Żbikowska-Migoń, A. (2001), Karl Heinrich Frommichen (1736-1783) and Adrian Balbi (1782-1848) - The pioneers of biblio- and scientometrics. *Scientometrics*, **52** (2), 225-233.

Full Text: [2001\Scientometrics52, 225.pdf](2001/Scientometrics52,%20225.pdf)

Abstract: When V. V, Nalimov in his important book Naukometriya (Moskva 1969) postulated research on the process of developement of science with the aid of quantitative methods, he listed many different indicators. There were among them the number and growth of scientific publications books and periodicals, the number of scientists, the level of expenditure. This article shows that the importance of these indicators was recognised by earlier authors.

Keywords: Books, Periodicals, Publications, Research, Science, Scientific Publications, Scientometrics

Arunachalam, S. (2001), Mathematics research in India today: What does the literature reveal? *Scientometrics*, **52** (2), 235-259.

Full Text: [2001\Scientometrics52, 235.pdf](2001/Scientometrics52,%20235.pdf)

Abstract: Mathematics research in India, as reflected by papers indexed in Mathsci 1988-1998, is quantified and mapped. Statistics, quantum theory and general topology are the three subfields contributing the most to India’s output in mathematics research, followed by special functions, economics and operations research, and relativity and gravitational theory. Indian Statistical Institute and Tata Institute of Fundamental Research are the two leading publishers of research papers. Unlike in many other fields, Calcutta publishes the largest number of papers in mathematics, followed by Mumbai, New Delhi, Chermai and Bangalore. West Bengal, Uttar Pradesh, Maharashtra, Tamil Nadu and Delhi are the leading states. Researchers from 257 institutions spread over 134 cities/towns have published 17, 308 papers in the 11 years. About 92% of these papers have appeared in 877 journals published from 62 countries. Journals published in the USA, UK and the Netherlands are popular with Indian mathematicians. of the 36 journals that have published at least a hundred papers, 20 are Indian journals of which only two are indexed in Journal Citation Reports. In all, about 38.5% of papers have been published in Indian journals, as against about 70% in agriculture, 55% in life sciences, 33.5% in medicine and 20% in physics. In the later years, there has been a moderate shift to non-Indian journals. Close to 78% of papers have come from universities and colleges and 13% from the institutions under science related departments. Almost all papers in high impact journals are physics related and most of them have come from institutions under the Department of Atomic Energy. Over 15% of the 9760 papers published during 1993-1998 are internationally coauthored. In all of science, as seen from Science Citation Index, 14% of Indian papers were internationally coauthored in 1991 and 17.6% in 1998, The USA, Canada, and Germany are the important collaborating nations, followed by France, Italy, Japan and the UK.

Keywords: Science

? Egghe, L. and Rousseau, R. (2001), Symmetric and asymmetric theory of relative concentration and applications. *Scientometrics*, **52** (2), 261-290.

Full Text: [2001\Scientometrics52, 261.pdf](2001/Scientometrics52,%20261.pdf)

Abstract: Relative concentration theory studies the degree of inequality between two vectors (a(1),....,a(N)) and (alpha (1),....,alpha (N)). It extends concentration theory in the sense that, in the latter theory, one of the above vectors is (1/N,....,1/N) (N coordinates). When studying relative concentration one can consider the vectors (a(1),....,a(N)) and (alpha (1),.....,alpha (N)) as interchangeable (equivalent) or not. In the former case this means that the relative concentration of (a(1),....,a(N)) versus (alpha (1),....,alpha (N)) is the same as the relative concentration of (alpha (1),.....,alpha (N)) versus (a(1),....,a(N)). We deal here with a symmetric theory of relative concentration. In the other case one wants to consider (a(1),....,a(N)) as having a different role as and hence the results can be different when interchanging the vectors. This leads to an asymmetric theory of relative concentration. In this paper we elaborate both models, As they extend concentration theory, both models use the Lorenz order and Lorenz curves. For each theory we present good measures of relative concentration and give applications of each model.

Keywords: Concentration Theory, Information-Retrieval, Theory

Hood, W.W. and Wilson, C.S. (2001), The literature of bibliometrics, scientometrics, and informetrics. *Scientometrics*, **52** (2), 291-314.

Full Text: [2001\Scientometrics52, 291.pdf](2001/Scientometrics52,%20291.pdf)

Abstract: Since Vassily V. Nalimov coined the term ‘scientometrics’ in the 1960s, this term has grown in popularity and is used to describe the study of science: growth, structure, interrelationships and productivity. Scientometrics is related to and has overlapping interests with bibliometrics and informetrics. The terms bibliometrics, scientometrics, and informetrics refer to component fields related to the study of the dynamics of disciplines as reflected in the production of their literature, Areas of study range from charting changes in the output of a scholarly field through time and across countries, to the library collection problem of maintaining control of the output, and to the low publication productivity of most researchers. These terms are used to describe similar and overlapping methodologies. The origins and historical survey of the development of each of these terms are presented. Profiles of the usage of each of these terms over time are presented, using an appropriate subject category of databases on the DIALOG information service. Various definitions of each of the terms are provided from an examination of the literature. The size of the overall literature of these fields is determined and the growth and stabilisation of both the dissertation and non-dissertation literature are shown. A listing of the top journals in the three fields are given, as well as a list of the major reviews and bibliographies that have been published over the years.

Keywords: Bibliometrics, Bradford Distribution, Citation Analysis, Cocitation Analysis, Definition, Information-Science, Journals, Scholarly Communication

? Zorin, N.A., Nemtsov, A.V. and Kalinin, V.V. (2001), Formalised assessment of publication quality in Russian psychiatry. *Scientometrics*, **52** (2), 315-322.

Full Text: [2001\Scientometrics52, 315.pdf](2001/Scientometrics52,%20315.pdf)

Abstract: A comparative study was carried out to determine the quality of research papers published during 1996 in two leading Russian psychiatric journals: Social and Clinical Psychiatry - SCP (27 papers) and the Journal of Neuropathology and Psychiatry S.S. Korsakov - JNP (33 papers). A newly created “Checklist for the formalised assessment of medical papers” elaborated on the principles of the evidence-based medicine was used for the analysis. A paper was defined as a scientific study if the suggested hypothesis had been verified by the methods that permitted to minimise systematic errors, to take into consideration random errors and if conclusions and arguments answered the suggested goals and were based on the data obtained. 1/3 of all papers in both journals appeared to be purely descriptive ones. Tbe analysis showed that only 2 papers in SCP (7%) and 5 papers in JNP (15%) could be defined as scientific studies. 12% of papers met the requirements of scientific standards to a certain extent. But 77% of papers published in 1996 were real spoilage of scientific research.

Keywords: Assessment, Evidence-Based Medicine, Journals, Medical, Medicine, Psychiatry, Publication, Research, Research Papers, Standards

Marshakova-Shaikevich, I. (2001), Scientometric perspectives of the analysis of chemical terminology. *Scientometrics*, **52** (2), 323-336.

Full Text: [2001\Scientometrics52, 323.pdf](2001/Scientometrics52,%20323.pdf)

Abstract: This paper is dedicated to the memory of Prof. Nalimov. The paper is to show some possibilities of bibliometric methods applied to Subject Index to ‘CHEMICAL ABSTRACT’ (CA) and to Permuterm Subject Index to ‘SCIENCE CITATION INDEX’.

? Shapiro, S.I. (2001), The Universe Grasper. *Scientometrics*, **52** (2), 337-344

Full Text: [2001\Scientometrics52, 337.pdf](2001/Scientometrics52,%20337.pdf)

? Nalimov, V.V., Drogalina-Nalimov, J. and Zuyev, K. (2001), The universe of meanings. *Scientometrics*, **52** (2), 345-360

Full Text: [2001\Scientometrics52, 345.pdf](2001/Scientometrics52,%20345.pdf)

? Kretschmer, H. (2001), Selected papers of the “Second Berlin Workshop on Scientometrics and Informetrics/Collaboration in Science and in Technology and First COLLNET Meeting” - Berlin (Germany), September 1-4, 2000 - Preface. *Scientometrics*, **52** (3), 363-364.

Full Text: [2001\Scientometrics52, 363.pdf](2001/Scientometrics52,%20363.pdf)

Keywords: Science, Scientometrics, Technology

? Beaver, D.D. (2001), Reflections on scientific collaboration, (and its study): Past, present, and future. *Scientometrics*, **52** (3), 365-377.

Full Text: [2001\Scientometrics52, 365.pdf](2001/Scientometrics52,%20365.pdf)

Abstract: Personal observations and reflections on scientific collaboration and its study, past, present, and future, containing new material on motives for collaboration, and on some of its salient features. Continuing methodological problems are singled out, together with suggestions for future research.

Keywords: Co-Authorship, Collaboration, Research

Basu, A. and Aggarwal, R. (2001), International collaboration in science in India and its impact on institutional performance. *Scientometrics*, **52** (3), 379-394.

Full Text: [S\Scientometrics52, 379.pdf](S/Scientometrics52,%20379.pdf)

Abstract: In this paper, our objective is to delineate some of the problems that could arise in using research output for performance evaluation. Research performance in terms of the Impact Factor (IF) of papers, say of scientific institutions in a country, could depend critically on coauthored papers in a situation where internationally co-authored papers are known to have significantly different (higher) impact factors as compared to purely indigenous papers. Thus, international collaboration not only serves to increase the overall output of research papers of an institution, the contribution of such papers to the average Impact Factor of the institutional output could also be disproportionately high. To quantify this effect, an index of gain in impact through foreign collaboration (GIFCOL) is defined such that it ensures comparability between institutions with differing proportions of collaborative output. A case study of major Indian institutions is undertaken, where Cluster Analysis is used to distinguish between intrinsically high performance institutions and those that gain disproportionately in terms of perceived quality of their output as a result of international collaboration.

? Davis, M. and Wilson, C.S. (2001), Elite researchers in ophthalmology: Aspects of publishing strategies, collaboration and multi-disciplinarity. *Scientometrics*, **52** (3), 395-410.

Full Text: [2001\Scientometrics52, 395.pdf](2001/Scientometrics52,%20395.pdf)

Abstract: This study covers a ten-year period, 1990-1999, of the publishing careers of nine authors who appear in the top-20 most productive authors in the field of ophthalmology In this paper we discuss findings from a study of the publishing careers of elite researchers in the field of ophthalmology. The paper highlights the extent and nature of the journals in which these elite researchers publish their work. Data derived from the study include indications of multidisciplinary involvement or ‘work-space’ interests, publication characteristics, and: collaborative engagement with others. We provide insights into the workings of author productivity, characteristics of papers such as numbers per paper of pages, references, and: authors, and initial findings about their collaboration patterns. These findings, showing! (ir)regularities or patterns in publishing careers, may be of interest to researchers and practitioners because they provide a view that might not otherwise be apparent to the field or to authors themselves.

Keywords: Author Productivity, Collaboration, Journals, Publication, Publishing, Researchers

? Gläser, J. and Laudel, G. (2001), Integrating scientometric indicators into sociological studies: Methodical and methodological problems. *Scientometrics*, **52** (3), 411-434.

Full Text: [2001\Scientometrics52, 411.pdf](2001/Scientometrics52,%20411.pdf)

Abstract: This article discusses the methodological problems of integrating scientometric methods into a, qualitative study. Integrative attempts of this kind are poorly supported by the methodologies of both the sociology of science and scientometrics. Therefore it was necessary to develop a project-specific methodological approach that linked scientometric methods to theoretical considerations. The methodological approach is presented and used to discuss general methodological problems concerning the relation between (qualitative) theory and scientometric methods. This discussion: enables some conclusions to be drawn as to the relations that exist between scientometrics and them sociology of science.

Keywords: Big Scientometrics, Citation, Communication, East, Journals, Patterns, Physics, Science, Scientometric Indicators, Scientometrics, Sociology of Science, Spanish, Technology, Theory

Havemann, F. (2001), Collaboration behaviour of Berlin life science researchers in the last two decades of the twentieth century as reflected in the Science Citation Index. *Scientometrics*, **52** (3), 435-443.

Full Text: [S\Scientometrics52, 435.pdf](S/Scientometrics52,%20435.pdf)

Abstract: Coming together to get publishable research results is not always a simple task. There can be geographical, cultural, disciplinary and political barriers, which have to be overcome. The Berlin Wall was such a barrier. After its fall in November 1989 Berlin scientists changed their collaboration behaviour. Research groups in East Berlin went West to look for partners and vice versa. The numbers of papers in life science journals with co-authors working in Berlin and coauthors in other places are discussed against the background of the international trend to more and more collaboration in science.

? Kretschmer, H., Liang, L.M. and Kundra, R. (2001), Chinese-Indian-German collaboration results that provided the impetus for the foundation of COLLNET. *Scientometrics*, **52** (3), 445-456.

Full Text: [2001\Scientometrics52, 445.pdf](2001/Scientometrics52,%20445.pdf)

Abstract: The collaboration model of Kretschmer was applied to the co-authorship network of Indian medicine with the aim of being able to observe changes in structure over a period of 30 years. The idea of Liang, on her “Distribution of Major Scientific and Cultural Achievements in Terms of Age” was put in relation to the collaboration model by Kretschmer.

Keywords: Co-Authorship, Collaboration, Medicine, Model

Lange, L.L. (2001), Citation counts of multi-authored papers: First-named authors and further authors. *Scientometrics*, **52** (3), 457-470.

Full Text: [2001\Scientometrics52, 457.pdf](2001/Scientometrics52,%20457.pdf)

Abstract: To examine whether primary-citation indexing can be taken as an unbiased representation of all-author indexing, we compared the cited first-author counts (straight counts) with the: cited all-author counts (complete counts) in two psychological journals over two publication years. Although rather high correlations were found between straight counts and complete counts, correlations differ with journals of the same discipline, with different publication years of them same journal, and according to seniority of cited authors. No effect of alphabetical name ordering was found. Results are discussed against the background of the possible use of weighting procedures for all-author indexing.

Keywords: Productivity

? Liang, L.M., Kretschmer, H., Guo, Y.Z. and Beaver, D.D. (2001), Age structures of scientific collaboration in Chinese computer science. *Scientometrics*, **52** (3), 471-486.

Full Text: [2001\Scientometrics52, 471.pdf](2001/Scientometrics52,%20471.pdf)

Abstract: This paper is a scientometric study of the age structure of scientific collaboration in Chinese computer science, Analysis reveals some special age structures in scientific collaboration in Chinese computer science. Most collaborations are composed of scientists younger than thirty-six (Younger) or older than fifty (Elder). For two-dimensional collaboration formed by first and second authors, Younger-Elder and Younger-Younger are the Predominant age structures. For three-dimensional collaboration formed by first, second and third authors, Younger-Younger-Elder and Younger-Younger-Younger are the most important age structures. Collaboration between two authors older than 38 amounts to only 6.4 percent of all two-person collaborations. Collaboration between two middle-aged scientists is seldom seen. Why do such types of age structure in Chinese computer science exist? We suggest a tentative, explanation based on analyses of the age composition of all authors, the age distributions of the authors in different ranks, and the name-ordering of authors in articles written by professors and their students.

Keywords: Articles, Collaboration, Computer, Science

? Mutschke, P. and Haase, A.Q. (2001), Collaboration and cognitive structures in social science research fields. Towards socio-cognitive analysis in information systems. *Scientometrics*, **52** (3), 487-502.

Full Text: [2001\Scientometrics52, 487.pdf](2001/Scientometrics52,%20487.pdf)

Abstract: Bibliographic information systems have to address the needs of users by providing “value-added-components.” For instance, users would benefit from knowing the social and cognitive structures of research fields. Research suggests that a relationship exists between actors’ position in scientific networks and the innovativeness of themes they examine. The present study confirms: and expands these results through a technique that relates the cognitive and social structures of a research field (socio-cognitive analysis). The results from two social science fields suggest that well-integrated actors are engaged in the consolidation of the mainstream, whereas new ideas are most likely to be introduced and pursued by social climbers, i.e., actors who are starting to form a social network of collaboration.

Keywords: Co-Word Analysis, Collaboration, Networks, Research, Science, Scientific Networks

? Wagner-Döbler, R. (2001), Continuity and discontinuity of collaboration behaviour since 1800 - from a bibliometric point of view. *Scientometrics*, **52** (3), 503-517.

Full Text: [2001\Scientometrics52, 503.pdf](2001/Scientometrics52,%20503.pdf)

Abstract: Time-series of collaboration trends indicated through co,authorships are examined from 1800 to presence in mathematics, logic, and physics. In physics, the share of co-authored papers expands in the second half of the 19th century, in mathematics in the first decades of the 20th century, in logic in the second half of the 20th century. Subdisciplines of mathematics, of physics, and areas of logic show large differences in their respective propensities to collaborate. None of the existing explanatory approaches meets this: heterogeneity, the most salient: feature is a propensitiy to collaborate in fields where theoretical and applied research is combined.

Keywords: Bibliometric, Collaboration, Mathematics, Research, Scientific Co-Authorship

Kundra, R. and Tomov, D. (2001), Collaboration Patterns in Indian and Bulgarian Epidemiology of Neoplasms in Medline for 1966–1999. *Scientometrics*, **52** (3), 519-523.

Full Text: [2001\Scientometrics52, 519.pdf](2001/Scientometrics52,%20519.pdf)

Abstract: The publication output of India and Bulgaria on epidemiology of neoplasms as reflected in Medline on CD-ROM for 1966–1999 was scientometrically analyzed. Indians have published 347 papers in 24 domestic journals but 444 papers in 169 journals from 21 countries. Bulgarians have published 88 papers in 6 Bulgarian journals but 63 papers in 39 journals from 13 countries. Some 17 journals from 8 countries contained papers by Indian and Bulgarian authors both. Oncology dominated with 46 different journals. Indians have published papers in foreign journals of 30 thematic profiles but Bulgarians - of 12 ones. The collaboration of Indians and Bulgarians resulted from joint bilateral projects and/or postgraduate studies abroad.

? Wenzel, V. (2001), Complex systems in natural science and humanities. *Scientometrics*, **52** (3), 525-529.

Full Text: [2001\Scientometrics52, 525.pdf](2001/Scientometrics52,%20525.pdf)

Abstract: In this paper specifics of the research subject within the natural sciences and humanities are supposed to be well-known. These specifics set limits: to communication between, scholars and natural scientists. In particular this leads to critical situations in cases if both participantes have to collaborate within a common interdisciplinary research work. The modem conception of complex system as subject of investigation for both natural sciences and humanities have in this context an integrating function. The term ‘complex system’ is now recognized as a transdisciplinary matters of research. Despite of the well-known differences between two fields of modem science one can find on this condition a number of mechanisms which are generating also common properties of them.

Keywords: Complex, Humanities, Mechanisms, Research, Research Work, Science, System

? Kretschmer, H., Liang, L.M. and Kundra, R. (2001), Foundation of a global interdisciplinary research network (COLLNET) with Berlin as the virtual centre. *Scientometrics*, **52** (3), 531-537.

Full Text: [2001\Scientometrics52, 531.pdf](2001/Scientometrics52,%20531.pdf)

Abstract: The growing importance of collaboration in research and the still underdeveloped state-of-the-art of research on collaboration have encouraged scientists from 16 countries to establish a global interdisciplinary research network under the title “Collaboration in Science and in Technology” (COLLNET) with Berlin as its virtual centre which has been set up on January Ist, 2000. The network is to comprise the prominent scientists, who work at present mostly in the field of quantitative science studies. The intention is to work together in co-operation both on theoretical and applied aspects.

Keywords: Collaboration, Research, Science

Markusova, V.A., Wilson, C.S. and Davis, M. (2002), From bioweapon to biodefense - The collaborative literature of biodefense in the 1990s. *Scientometrics*, **53** (1), 21-38.

Full Text: [S\Scientometrics53, 21.pdf](S/Scientometrics53,%2021.pdf)

Abstract: The biological arms race could have been considered a closed chapter in the Cold War history. However, the growth of different terrorist groups and organisations has increased the threat of biological weapon (BW) use. The goal of this pilot scientometric project was to trace changes in biodefense research and the activities of its main players, Russia and the US. Data were collected from the SCI via the Dialog information system for 1991-2000, the period covering the post-soviet era. In-depth content analysis was performed on selected papers from the 2870 publications identified as BW-related. During the period examined, the publication flow increased by 250 percent. The main contributors to this literature weir shown to be the US, Russia, UK France and Germany. The results presented in this paper are of interest to security analysis (follwing the attacks in the US of 11th September 200 1), to public health care policy researchers and to politicians,

de Arenas, J.L., Castaños-Lomnitz, H. and Arenas-Licea, J. (2002), Significant Mexican research in the health sciences: A bibliometric analysis. *Scientometrics*, **53** (1), 39-48.

Full Text: [2002\Scientometrics53, 39.pdf](2002/Scientometrics53,%2039.pdf)

Abstract: In the 1970s Mexico started to consolidate its S&T system by training human resources and actively preventing brain drain, mainly by motivating researchers through economic incentives. Considering Bradford’s Law, an analysis of significant Mexican research in the health sciences, i.e., papers published in journals with a high-impact factor which grant a degree of credibility and importance was carried out. Significant papers produced in Mexico show a measure of the country’s productivity, and these papers’ citations measure the country’s international impact.

Keywords: Bibliometric Analysis, Citations, Journals, Research

Kademani, B.S., Kalyane, V.L. and Kumar, V. (2002), A. H. Zewail: Research collaborator par excellence. *Scientometrics*, **53** (1), 113-121.

Full Text: [S\Scientometrics53, 113.pdf](S/Scientometrics53,%20113.pdf)

Abstract: Ahmed Hassan Zewail, the Nobel laureate (1999) in chemistry have collaborated with 103 colleagues and has published 246 papers during 1976 to 1994 in, femtochemistry (62), reaction rates and IVR (56), general reviews (49), coherence and optical dephasing phenomena (27), solids: magnetic resonance and optical studies (13), liquids and biological systems (9), local modes in large molecules (9), molecular structure from rotational coherence (8), solar energy concentrators (7), and other studies (6). This authorship pattern included: three authored papers (87) followed by two authored (78), four authored (38), one authored (30), five authored (8), and six authored (5). Highest collaborations were with P. M. Felker (39), M. Damns (19), and L. R. Khundkar (16). The core journals publishing his papers were: J. Chem. Phys. (77), Chem. Phys. Lett. (53), J. Phys. Chem. (33), and Nature (6) out of the 33 journal channels and 32 chapters in books.

Keywords: Scientometric Portrait, Chemistry

Leydesdorff, L. (2002), Indicators of structural change in the dynamics of science: Entropy statistics of the *SCI Journal Citation Reports*. *Scientometrics*, **53** (1), 131-159.

Full Text: [S\Scientometrics53, 131.pdf](S/Scientometrics53,%20131.pdf)

Abstract: Can change in citation patterns among journals be used as an indicator of structural change in the organization of the sciences? Aggregated journal-journal citations for 1999 are compared with similar data in the Journal Citation Reports 1998 of the Science Citation Index. In addition to indicating local change, probabilistic entropy measures enable us to analyze changes in distributions at different levels of aggregation. The results of various statistics are discussed and compared by elaborating the journal-journal mappings. The relevance of this indicator for science and technology policies is further specified.

Keywords: Communication, Intelligence, Performance, Technology, Knowledge, Impact, Areas

Gupta, B.M., Kumar, S., Sangam, S.L. and Karisiddappa, C.R. (2002), Modeling the growth of world social science literature. *Scientometrics*, **53** (1), 161-164.

Full Text: [S\Scientometrics53, 161.pdf](S/Scientometrics53,%20161.pdf)

Abstract: The main objectives of this study are: (a) to find the applicability of selected growth models to the growth of publications in six subdisciplines of social sciences, namely anthropology, economics, history, political science, psychology, and sociology in the world, and (b) to verify the criteria for selecting the most appropriate growth model suggested by *Egghe* and *Rao* (1992).

Jeevan, V.K.J. and Gupta, B.M. (2002), A scientometric analysis of research output from Indian Institute of Technology, Kharagpur. *Scientometrics*, **53** (1), 165-168.

Full Text: [S\Scientometrics53, 165.pdf](S/Scientometrics53,%20165.pdf)

Abstract: The objective of this paper is to suggest a methodology for studying the quantitative profile of a research university, with a view to get idea about the performance and impact of research produced in each department, and the comparison of the impact of research in various departments.

? Glänzel, W. and Moed, H.F. (2002), Journal impact mmeasures: Their role in research policy and scientific information management - Selected papers of the Speical Day Session at the 8th International Conference on Scientometrics and Informetrics, held in Sydney (Australia) on 17 July, 2001. Preface. *Scientometrics*, **53** (2), 169-170.

Full Text: Scientometrics53, 169.pdf

Glänzel, W. and Moed, H.F. (2002), Journal impact measures in bibliometric research. *Scientometrics*, **53** (2), 171-193.

Full Text: [S\Scientometrics53, 171.pdf](S/Scientometrics53,%20171.pdf)

Abstract: The Impact Factor introduced by Eugene Garfield is a fundamental citation-based measure for significance and performance of scientific journals. It is perhaps the most popular bibliometric product used in bibliometrics itself, as well as outside the scientific community. First, a concise review of the background and history of the ISI impact factor and the basic ideas underlying it are given. A cross-citation matrix is used to visualise the construction of the Impact Factor and several related journal citation measures*.* Both strengths and flaws of the impact factor are discussed. Several attempts made by different authors to introduce more sophisticated journal citation measures and the reasons why many indicators aiming at a correction of methodological limitations of the Impact Factor were not successful are described.

The next section is devoted to the analysis of basic technical and methodological aspects. In this context, the most important sources of possible biases and distortions for calculation and use of journal citation measures are studied. Thereafter, main characteristics of application contexts are summarised.

The last section is concerned with questions of statistical reliability of journal citation measures. It is shown that in contrast to a common misbelief statistical methods can be applied to discrete ‘skewed’ distributions, and that the statistical reliability of these statistics can be used as a basis for application of journal impact measures in comparative analyses. Finally, the question of sufficiency or insufficiency of a single, howsoever complex measure for characterising the citation impact of scientific journals is discussed.

Butler, L. (2002), Identifying ‘highly-rated’ journals: An Australian case study. *Scientometrics*, **53** (2), 207-227.

Full Text: [S\Scientometrics53, 207.pdf](S/Scientometrics53,%20207.pdf)

Abstract: A study undertaken in 1996 of Australia’s performance in the high impact journals of a few selected fields of science has produced empirical data for examining the factors that influence peers in their choice of the ‘highly-rated’ journals in their field. A number of characteristics were used to compare the selected journals with those having the highest impact factor, as listed in ISI’s Journal Citation Reports. This paper ranked journals on three impact factors - ISI’s impact factor for two consecutive years, and one calculated for a five-year window. The data suggests that the type of impact measure was less important in journal selection than the long-term validity of the rankings. A group of experts was less likely to include journals that were only highly ranked for a short period in their ‘top 20’. Of the more descriptive journal characteristics analysed, the age of the journal appeared significant. Their selections also appeared biased against journals that were relatively new, regardless of how high their impact factor was.

Lewison, G. (2002), Researchers’ and users’ perceptions of the relative standing of biomedical papers in different journals. *Scientometrics*, **53** (2), 229-240.

Full Text: [S\Scientometrics53, 229.pdf](S/Scientometrics53,%20229.pdf)

Abstract: Journal citation impact factors, which are frequently used as a surrogate measure of research quality, do not correlate well with UK researchers’ subjective views of the relative importance of journals as media for communicating important biomedical research results. The correlation varies with the sub-field: it is almost zero in nursing research but is moderate in more ‘scientific’ subfields such as multiple sclerosis research, characterised by many authors per paper and appreciable foreign co-authorship. If research evaluation is to be based on journal-specific indicators, then these must cover different aspects of the process whereby research impacts on other researchers and on healthcare improvement.

Keywords: Biomedical, Biomedical Research, Citation, Co-Authorship, Coauthorship, Correlation, Evaluation, Impact, Impact Factors, Impacts, Improvement, Indicators, Journals, Measure, Media, Multiple Sclerosis, Nursing, Papers, Quality, Research, Research Evaluation, Research Quality, Research Results, Surrogate, UK

Rinia, E.J., Van Leeuwen, T.N. and Van Raan, A.F.J. (2002), Impact measures of interdisciplinary research in physics. *Scientometrics*, **53** (2), 241-248.

Full Text: [S\Scientometrics53, 241.pdf](S/Scientometrics53,%20241.pdf)

Abstract: In an evaluation of physics research programs in the Netherlands, held in 1996, assessments of research by expert panels were supplemented with bibliometric analysis. This latter analysis included the calculation of several bibliometric indicators, among which some taking journal impact measures as a baseline. Final outcomes of this evaluation provided an opportunity to re-examine the results of this assessment from the perspective of the degree of interdisciplinarity of programs involved. In this paper we discuss results of this latter analysis, in particular with respect to the relation between several citation based indicators and interdisciplinary research in Dutch physics

Keywords: Bibliometric, Bibliometric Analysis, Citation, Journal Impact, Research

van Leeuwen, T.N. and Moed, H.F. (2002), Development and application of journal impact measures in the Dutch science system. *Scientometrics*, **53** (2), 249-266.

Full Text: [S\Scientometrics53, 249.pdf](S/Scientometrics53,%20249.pdf)

Abstract: This paper discusses development and application of journal impact indicators in a number of bibliometric studies commissioned by Dutch organizations and institutions, and conducted in our institute during the past five years. An outline is given of the research questions addressed in these studies and their policy context. For each study the appropriateness of the use of journal impact indicators produced by the Institute for Scientific Information (ISI) is evaluated. Alternative journal impact measures were developed which are shown to be more appropriate in the particular research and policy contexts than the ISI measures. These measures were considered to be highly useful by the users. The studies have revealed methodological flaws of the ISI journal impact factors.

Vinkler, P. (2002), Subfield problems in applying the Garfield (Impact) Factors in practice. *Scientometrics*, **53** (2), 267-279.

Full Text: [S\Scientometrics53, 267.pdf](S/Scientometrics53,%20267.pdf)

Abstract: The assessment of the publications of research teams working on different subfields raises concerns because of the different scientometric features of the subfields. For equalizing the differences in the Garfield (Impact) Factors of journals, several methods applied in practice have been described. A new indicator - Specific Impact Contribution (SIC) relating the citation share of a respective team (or journal) in the total citations of the teams (or journals) evaluated to its share in publications - was introduced. It has been realized that the normalized Garfield Factors and the normalized SIC values are identical measures within any selected set of journals. Consequently, the Garfield Factor of a journal should be assumed as an indicator characterizing the contribution of the information channel as a whole, appropriately.

Keywords: Scientometric Indicators, Journals, Citation

Moed, H.F. (2002), Measuring China’s research performance using the Science Citation Index. *Scientometrics*, **53** (3), 281-296.

Full Text: [S\Scientometrics53, 281.pdf](S/Scientometrics53,%20281.pdf)

Abstract: This contribution focuses on the application of bibliometric techniques to research activities in China, based on data extracted from the Science Citation Index (SCI) and related Citation Indexes, produced by the Institute for Scientific Information (ISI).

The main conclusion is that bibliometric analyses based on the ISI databases in principle provide useful and valid indicators of the international position of Chinese research activities, provided that these analyses deal properly with the relatively large number of national Chinese journals covered by the ISI indexes.

It is argued that it is important to distinguish between a national and an international point of view. In order to assess the Chinese research activities from a national perspective, it is appropriate to use the scientific literature databases with a good coverage of Chinese periodicals, such as the Chinese Science Citation Database (CSCD), produced at the Chinese Academy of Sciences. Assessment of the position of Chinese research from an international perspective should be based on the ISI databases, but it is suggested to exclude national Chinese journals from this analysis.

In addition it is proposed to compute an indicator of international publication activity, defined as the percentage of articles in journals processed for the ISI indexes, with the national Chinese journals being removed, relative to the total number of articles published either in national Chinese or in other journals, regardless of whether these journals are processed for the ISI indexes or not. This indicator can only be calculated by properly combining CSCD and ISI indexes.

Keywords: Scientific Journals, Internationalization, Database

Uzun, A. (2002), Productivity ratings of institutions based on publication in Scientometrics, Informetrics, and Bibliometrics, 1981-2000. *Scientometrics*, **53** (3), 297-307.

Full Text: [S\Scientometrics53, 297.pdf](S/Scientometrics53,%20297.pdf)

Abstract: The author surveyed a set of ten scholarly journals that publish the mainstream of papers in the field of Scientometrics, Informetrics, and Bibliometrics (SIB). The survey is limited only to the research articles published in the field for the two decades period 1981-2000. Each journal was examined issue by issue for the institutional affiliations of contributing authors. Institutional rankings for the total period and the two decade periods, 1981-1990 and 1991-2000 were determined by awarding credit to the authors’ institutions based on authorship. In the composite of ten journals, the University Sheffield (England), the University of North Carolina (USA), the University of Leiden (Netherlands), the City University of London (England), the National Institute of Science, Technology and Development Studies (India), the University of Sussex (England), the University of Illinois (USA), the University of Michigan (USA), the Hungarian Academy of Sciences Library (Hungary), and Indiana University (USA) emerged as the ten most productive institutions for the period 1981-2000.

Keywords: Scientists

Burrell, Q.L. (2002), The nth-citation distribution and obsolescence. *Scientometrics*, **53** (3), 309-323.

Full Text: [S\Scientometrics53, 309.pdf](S/Scientometrics53,%20309.pdf)

Abstract: The stochastic model proposed recently by the author to describe the citation process in the presence of obsolescence is further investigated to illustrate the nth-citation distribution and the distribution of the total number of citations. The particular case where the latent rate has a gamma distribution is analysed in detail and is shown to be able to agree well with empirical data.

Keywords: Library Circulation Model

Eto, H. (2002), Authorship and citation patterns in Management Science in comparison with operational research. *Scientometrics*, **53** (3), 337-349.

Full Text: [S\Scientometrics53, 337.pdf](S/Scientometrics53,%20337.pdf)

Abstract: The authorship and citation patterns in the journal titled Management Science (MS) are analysed. The purpose of the analysis is to examine the competitive relation of MS with OR (operational research or operations research). The analysis is focused on the use of mathematical methods, because MS entered the management research area by using mathematical methods developed by OR and because the use of mathematical methods in real management is facing difficulties. The relationship of MS with information systems (IS) and organisation research (Org) is analysed in regard to the competition of MS with OR. The analysis reveals the intermediate character of MS, that is, MS is less prone to mathematical methods and is more inclined towards IS and Org than OR is.

Ren, S. and Rousseau, R. (2002), International visibility of Chinese scientific journals. *Scientometrics*, **53** (3), 389-405.

Full Text: [S\Scientometrics53, 389.pdf](S/Scientometrics53,%20389.pdf)

Abstract: We discuss the internationalisation and the visibility of Chinese journals covered by the Institute for Scientific Information (ISI). Attention is focused on physics and chemistry journals. For these journals the country of origin of published papers and their citation patterns are analysed. As an indicator of internationality we further consider the composition of their editorial boards. It is concluded that even those Chinese journals that are covered by ISI are still rather ‘local’ and suffer from a low visibility in the world. Yet we are optimistic about the future of Chinese science and its scientific journals.

Macías-Chapula, C.A. (2002), Bibliometric and webometric analysis of health system reforms in Latin America and the Caribbean. *Scientometrics*, **53** (3), 407-427.

Full Text: [S\Scientometrics53, 407.pdf](S/Scientometrics53,%20407.pdf)

Abstract: Health systems are reforming their structures and services world-wide. Both, developed and developing countries are searching for better organisation and functioning schemes of their health systems. The social service delivery system in developing countries is severely limited in its ability to respond and adjust to changing circumstances by institutional, organisational, and structural factors. As a result, different countries of the Latin American and Caribbean regions have developed a diversity of reform models.

While international agencies and non-government academic organisations have been funding some of the health system reform initiatives among developing countries, no clear picture exists as to the results or impact of this support. Indicators related to knowledge administration, published results or shared experiences are needed to establish a diagnosis of the existing situation and to support decision making processes in ten-as of policy and research funding.

This work presents the results of a bibliometric and webometric analysis on the production and distribution of the literature generated on health system reforms, as produced in or about Latin America and the Caribbean, for the period 1980-1999.

Results indicated the limitations and low quality of local and regional databases to represent the productivity in the field. Data was obtained regarding the patterns of production and distribution of documents over time, the main countries and areas involved in health system reform processes, and the institutions behind the initiatives. The implications of the results derived from this research to health policy makers, researchers, librarians, database producers, and information scientists are discussed by the author.

? Egghe, L. and Rousseau, R. (2002), A proposal to define a core of a scientific subject: A definition using concentration and fuzzy sets. *Scientometrics*, **54** (1), 51-62.

Full Text: [2002\Scientometrics54, 51.pdf](2002/Scientometrics54,%2051.pdf)

Abstract: Determining the core of a field’s literature, i.e. its ‘most important’ sources, has been and still is an important problem in bibliometrics. In this article an exact definition of a core of a bibliography or a conglomerate is presented. The main ingredients for this definition are: fuzzy set theory, Lorenz curves and concentration measures. If one prefers a strict delineation, the fuzzy core can easily be defuzzified. The method we propose does not depend on the subjective notion of ‘importance’. It is, moreover, completely reproducible. The method and the resulting core is also independent of the mathematical function (Lotka, Zipf, Bradford, etc.) that may be used to describe the relation between the set of sources and that of items.

Glänzel, W. and de Lange, C. (2002), A distributional approach to multinationality measures of international scientific collaboration. *Scientometrics*, **54** (1), 75-89.

Full Text: [S\Scientometrics54, 75.pdf](S/Scientometrics54,%2075.pdf)

Abstract: In a recent study, de Lange and Glänzel introduced a model for the bibliometric analysis of the extent of multinational co-authorship links. They showed that this model can be considered a generalisation of the ‘fractionation approach’ by Nederhof and Moed. The authors analysed international collaboration links (the Multilateral Collaboration Index) as a function of the share of internationally co-authored papers. The measurement of the deviation of individual countries from (sub-)field peculiarities proved, however, complicated. The intensifying international collaboration and, in several fields, the substantial growth of number of multinational papers (involving three or more countries) in the 90s necessitates a detailed analysis of co-publication distributions, that is, of the distributions of partner countries in a given country’s publication output. The main objective of the study is to elaborate such a measure to be used in addition to the share of international publications and the Multilateral Collaboration Index. In addition, a detailed analysis of national citation impact of domestic, bilateral and multilateral papers in the major science fields is conducted.

The model, we develop and the statistical analysis that it allows, support the practical conclusion that the ratio of the number of international links and international papers turns out to be roughly proportional to the ratio of full and fractional publication counts.

Keywords: Multilateral Co-Authorship, Publication, Indicators, Science

Haritash, N. and Gupta, B.M. (2002), Mapping of S&T issues in the Indian Parliament: A scientometric analysis of questions raised in both Houses of the Parliament. *Scientometrics*, **54** (1), 91-102.

Full Text: [S\Scientometrics54, 91.pdf](S/Scientometrics54,%2091.pdf)

Abstract: The Parliament, the highest legislative body in India, plays a significant role in formulating national policies. It is, therefore, pertinent to find the concern the Members of Parliament and different political parties show and the priorities they accord to the S&T related issues. They can judge it statistically through the number of questions raised/asked on the floor of the House. The study presents such an analysis taking the example from the S&T questions raised in the year 1992 during the Tenth Parliament. The analysis has been done by dividing the S&T related issues into 14 socio- economic areas, such as environmental sciences, biotechnology, energy, food and agriculture, health, natural resources, telecommunications, human resource development, etc. and eight policy areas such as technology policy, international collaborations in S&T, etc. The raising of S&T questions jointly by MPs and different political parties through inter- party and intra-party sponsorships has also been studied. Such an analysis may provide an important basis to the managers and policy makers in formulating the S&T policy of a country.

Jin, B.H., Zhang, J.G., Chen, D.Q. and Zhu, X.Y. (2002), Development of the Chinese Scientometric Indicators (CSI). *Scientometrics*, **54** (1), 145-154.

Full Text: [2002\Scientometrics54, 145.pdf](2002/Scientometrics54,%20145.pdf)

Abstract: We describe the Chinese Scientometric Indicators (CSI), an indicator database derived from the Chinese Science Citation Database (CSCD). Its design is supported by the Natural Sciences Foundation of China (NSFC). In this indicator database data of a statistical nature are organized and categorized leading to ranked lists and providing bases for comparisons among Chinese institutions and regions.

Larsen, B. (2002), Exploiting citation overlaps for Information Retrieval: Generating a boomerang effect from the network of scientific papers. *Scientometrics*, **54** (2), 155-178.

Full Text: [S\Scientometrics54, 155.pdf](S/Scientometrics54,%20155.pdf)

Abstract: A new citation search strategy is proposed for Information Retrieval (IR) based on the principle of polyrepresentation (Ingwersen, 1992, 1996). The strategy exploits logical overlaps between a range of cognitively different interpretations of the same documents in a structured manner, i.e. so-called cognitive overlaps of representations. The strategy is essentially a ‘cycling strategy’ starting with documents retrieved by a subject search, wherefrom new documents are identified automatically by following the network of citations in scientific papers backwards and forwards in time. In contrast to earlier citation search strategies the proposed strategy does not require known relevant documents (seed documents) as a starting point, but may be based on a subject search. A pilot study is reported where the ability of the strategy to retrieve additional relevant documents is analysed. Results show that a very large amount of documents can be retrieved by the strategy, and that these may be segmented in a number of distinct ‘overlap levels’. It is demonstrated that the combined core of the higher-level overlaps contains higher relevance density than found in the original retrieval results. Based on these results it is suggested that the documents be displayed in order of their presence in higher-level overlaps, so as to maximise the chances that as many relevant documents as possible will be presented first to a user.

Keywords: Systems, Science, Design, Web

Lewison, G. (2002), From biomedical research to health improvement. *Scientometrics*, **54** (2), 179-192.

Full Text: [S\Scientometrics54, 179.pdf](S/Scientometrics54,%20179.pdf)

Abstract: Traditional means of analysis of research outputs have focussed on citations to papers in journals in other journal publications. But these only chronicle the early stages whereby research in biomedicine is converted into health improvement through better patient care and through preventive measures. New evaluation methods, still based on the concept of citation of research in other documents, are needed and are now being developed. These include the use of textbooks in medical education and the analysis of governmental regulations and health policies, which can influence both the availability of new drugs and the control of toxic substances in food and the environment. There is also an interest in the way that newspapers report biomedical research advances. Readers include politicians, healthcare professionals, the general public (who are increasingly becoming active consumers of healthcare products) and other researchers who may value the immediacy of the reporting. Newspaper articles tend to focus on fashionable topics and to offer premature hopes of cures to disease, but they can also provide a valuable service in showing the importance of animal experiments to biomedical progress. It would be useful to create an international database of newspaper citations through a consortium of partners in different countries who would agree a common protocol and exchange information on a regular basis.

Keywords: Citations, Evaluation, Journals, Research

Narváez-Berthelemot, N., Russell, J.M., Arvanitis, R., Waast, R. and Gaillard, J. (2002), Science in Africa: An overview of mainstream scientific output. *Scientometrics*, **54** (2), 229-241.

Full Text: [S\Scientometrics54, 229.pdf](S/Scientometrics54,%20229.pdf)

Abstract: The total scientific output of mainstream articles for the 15 most productive African countries for the period 1991 to 1997 was 45,080, with South Africa and Egypt publishing 15,725 and 10,433, respectively. The productions of these two top ranked countries varied little from 1991-1997 while others such as the Maghreb countries increased between 75-102%. Total contributions were mainly in the fields of Clinical Medicine (36%), Biology (17%), Chemistry (14%), and Biomedical Research (12%). papers in international collaboration were overriding in Biomedical Research, Biology, Earth and Space Science, and Physics. Institutions in the US were the principal collaborators followed closely by those in France.

Nelson, M. and Downie, J.S. (2002), Informetric analysis of a music database. *Scientometrics*, **54** (2), 243-255.

Full Text: [S\Scientometrics54, 243.pdf](S/Scientometrics54,%20243.pdf)

Abstract: We analyse the statistical properties a database of musical notes for the purpose of designing an information retrieval system as part of the Musifind project. In order to reduce the amount of musical information we convert the database to the intervals between notes, which will make the database easier to search. We also investigate a further simplification by creating equivalence classes of musical intervals which also increases the resilience of searches to errors in the query. The Zipf, Zipf-Mandelbrot, Generalized Waring (GW) and Generalized Inverse Gaussian-Poisson (GIGP) distributions are tested against these various representations with the GIGP distribution providing the best overall fit for the data. There are many similarities with text databases, especially those with short bibliographic records. There are also some differences, particularly in the highest frequency intervals which occur with a much lower frequency than the highest frequency ‘stopwords’ in a text database. This provides evidence to support the hypothesis that traditional text retrieval methods will work for a music database.

Nisonger, T.E. (2002), The relationship between international editorial board composition and citation measures in political science, business, and genetics journals. *Scientometrics*, **54** (2), 257-268.

Full Text: [S\Scientometrics54, 257.pdf](S/Scientometrics54,%20257.pdf)

Abstract: Three measures of international composition on journal editorial boards - the number of countries represented on the board, the number of international members, and the proportion of international board members - were correlated with impact factor and total citation data in the 1999 Journal Citation Reports for 153 business, political science, and genetics journals. With a few exceptions the relationship between international editorial board composition and citation measures was non-linear, leading to the conclusion that international membership on the editorial board can not generally be used as a marker of better journal quality. Yet further investigation is warranted due to positive correlations between some editorial board and citation measures for non-U.S. business and political science journals.

Prime, C., Bassecoulard, E. and Zitt, M. (2002), Co-citations and co-sitations: A cautionary view on an analogy. *Scientometrics*, **54** (2), 291-308.

Full Text: [S\Scientometrics54, 291.pdf](S/Scientometrics54,%20291.pdf)

Abstract: Like the citation network of scientific publications, the Web is also a graph where pages are connected together by hypertext links or ‘sitations’. In the new research field Webometrics, scholars have investigated equivalencies between citationist concepts established in bibliometrics and hyperlinks networks. This paper focuses on the possible analogy between co-citation and co-sitation to structure Web universes. It reports an experiment in the field of bibliometrics and scientific indicators. Several technical aspects that must be dealt with are reviewed. Co-sitation seems a promising way to delineate topics on the Web. However, the analogy with traditional co-citation is deeply misleading: many precautions must be taken in the interpretation of the results.

Keywords: Scientific Literature, Science, Cocitation, Impact

Macías-Chapula, C.A. and Mijangos-Nolasco, A. (2002), Bibliometric analysis of AIDS literature in Central Africa. *Scientometrics*, **54** (2), 309-317.

Full Text: [S\Scientometrics54, 309.pdf](S/Scientometrics54,%20309.pdf)

Abstract: The purpose of this paper is to present the preliminary results of a bibliometric analysis of AIDS documents as produced on Sub-Saharan Africa. AIDSLINE 1980-2000 was used to conduct the literature search. In this paper, an analysis was made only of the records retrieved under ‘Central Africa’. Bibexcel (version 2001) and Microsoft Excel (2000) were used as software tools to conduct the analysis of the records. Seven countries and 1052 records were identified. Main participating countries were Democratic Republic of the Congo (527 documents), and Cameroon (271). Results indicated a high pattern of collaboration through multiple authorship. Most documents were published in English (84.50%) and French (14.73%). Over 57% corresponded to journal articles. The subject content of the documents was mainly focused on epidemiological, complications, and prevention & control issues on ‘HIV Infections’ and ‘Acquired Immunodeficiency Syndrome’. Countries behind this productivity were Cameroon, USA, Democratic Republic of the Congo, France, and Belgium. Comparison of results among Central African countries and among other developing countries is made by the authors.

Keywords: Immunodeficiency-Syndrome Aids, Latin-America

Ramani, S.V. and de Looze, M.A. (2002), Using patent statistics as knowledge base indicators in the biotechnology sectors: An application to France, Germany and the U.K. *Scientometrics*, **54** (3), 319-346.

Full Text: [S\Scientometrics55, 319.pdf](S/Scientometrics55,%20319.pdf)

Abstract: In order to formulate firm, national or regional technology policy, it is necessary to have indicators that can measure technological competence. This paper develops a set of indicators using patent statistics to compare the ‘knowledge base’ of individuals, laboratories, firms or nations. These indicators are then applied to the patent applications in France, Germany and the U.K. in the biotechnology sectors. The paper shows that France is lagging behind Germany and the U.K. in technology stocks (or its patent applications) in all biotechnology fields. However it is the leader in the technology network supporting the foods industry. It has a comparative advantage in terms of either technology stock counts or networks in Genetic Engineering, Pharmaceuticals, Foods, Chemicals, Cell Culture and Biocatalysis. Germany is leading in many sectors, but in all sectors in which it is a leader, it is a specialized leader, i.e. its technology networks need to be more extensive. It has a comparative advantage in terms of either technology stock counts or networks in all sectors except Genetic Engineering, Pharmaceuticals, Agriculture and Cell Culture. The U.K. is the leader in the important field of Genetic Engineering and in terms of the entire technology networks in the biotechnology sectors. It has a comparative advantage in terms of either technology stock counts or networks in Genetic Engineering, Pharmaceuticals, Agriculture and Purification.

Rinia, E.J., van Leeuwen, T.N., Bruins, E.E.W., van Vuren, H.G. and van Raan, A.F.J. (2002), Measuring knowledge transfer between fields of science. *Scientometrics*, **54** (3), 347-362.

Full Text: [S\Scientometrics54, 347.pdf](S/Scientometrics54,%20347.pdf)

Abstract: In this paper we report on the results of an exploratory study of knowledge exchange between disciplines and subfields of science, based on bibliometric methods. The goal of this analysis is twofold. Firstly, we consider knowledge exchange between disciplines at a global level, by analysing cross-disciplinary citations in journal articles, based on the world publication output in 1999. Among others a central position of the Basic Life Sciences within the Life Sciences and of Physics within the Exact Sciences is shown. Limitations of analyses of interdisciplinary impact at the journal level are discussed. A second topic is a discussion of measures which may be used to quantify the rate of knowledge transfer between fields and the importance of work in a given field or for other disciplines. Two measures are applied, which appear to be proper indicators of impact of research on other fields. These indicators of interdisciplinary impact may be applied at other institutional levels as well.

Keywords: Disciplines, Citation, Physics, Impact

Vinkler, P. (2002), Dynamic changes in the chance for citedness. *Scientometrics*, **54** (3), 421-434.

Full Text: [S\Scientometrics54, 421.pdf](S/Scientometrics54,%20421.pdf)

Abstract: A new index - Relative Publication Growth (RPG) - was suggested for characterizing the annual increase of publications in different selected periods. It has been revealed that the mean citedness of papers (‘Chance for Citedness’) increases parallel with increasing RPG and growing mean number of references in papers. The number of citations attainable by a paper published in a given journal may be estimated by multiplying the resp. Journal Citedness Factor (JCF) with the Garfield Factor of the resp. journal. The JCF values may represent the aging of information whereas GF-s the potential frequency of citations.

Keywords: Citation, Impact, Model

Liang, L.M., Guo, Y.Z. and Davis, M. (2002), Collaborative patterns and age structures in Chinese publications. *Scientometrics*, **54** (3), 473-489.

Full Text: [S\Scientometrics54, 473.pdf](S/Scientometrics54,%20473.pdf)

Abstract: This paper is the continued study on age structure of scientific collaboration in Chinese computer science. Based on an extended database a new method is used to analyze the nature and preference of collaboration. Observed values of two- three- and four-dimensional collaboration were compared respectively with their expected values. Investigation covered co-authors’ combination patterns, name permutations in their papers, especially the age of the first author.

Garg, K.C. (2002), Scientometrics of laser research in India and China. *Scientometrics*, **55** (1), 71-85.

Full Text: [S\Scientometrics55, 71.pdf](S/Scientometrics55,%2071.pdf)

Abstract: An analysis of 1223 papers published by India (347 papers) and China (876 papers) at conferences and in journals during 1993 and 1997 in the field of laser S&T indicates that China ‘s output was twice to that of India. However, Activity Indices for both the countries in 1993 and 1997 were almost the same. Chinese scientists preferred to publish in domestic journals, while Indian scientists published in foreign journals. The number of papers by Indian scientists in SCI covered journals and journals with high-Normalized Impact Factors was more than for China, and, thus India was better connected to the mainstream science compared to China. The impact made by Indian papers was more than for Chinese papers, as reflected by normalized impact per paper, proportion of papers in high quality journals, and publication effective index. Indian papers also got more citations per paper than Chinese papers. Team research appears to be better in China than in India, as reflected by the number of mega-authored papers produced by the two countries.

Fernández-Cano, A. and Bueno, Á. (2002), Multivariate evaluation of Spanish educational research journals. *Scientometrics*, **55** (1), 87-102.

Full Text: [S\Scientometrics55, 87.pdf](S/Scientometrics55,%2087.pdf)

Abstract: This paper informs about an evaluation of Spanish educational research journals using the modality of reputation inferred from survey data. Univariate and multivariate patterns are offered. Specifically cluster analysis and non-parametric multidimensional scaling reveal themselves as useful methods to inquire the complexity of this scientometric question which is the evaluation of periodical series.

Gülgöz, S., Yedekçioglu, Ö.A. and Yurtsever, E. (2002), Turkey’s output in social science publications: 1970-1999. *Scientometrics*, **55** (1), 103-121.

Full Text: [S\Scientometrics55, 103.pdf](S/Scientometrics55,%20103.pdf)

Abstract: Publications originating from Turkey in SSCI were analyzed for changes in the thirty-year span between 1970 and 1999. There has been a high rate of increase in the number of publications and most of these publications were in the form of articles and review papers. The rate of increase was lower than the increase in science publications but the rankings among other countries in sciences and social sciences were comparable. The analysis of impact factors and citations received by published work showed a decline across years. Many of the high-impact publications were joint work with foreign authors. The low level of impact was attributed in part by the difficulty of international scholars in belonging to research networks.

Tonta, Y. and Ilhan, M. (2002), Contribution of Hacettepe University Faculty of Medicine to the world’s biomedical literature (1988-1997). *Scientometrics*, **55** (1), 123-136.

Full Text: [S\Scientometrics55, 123.pdf](S/Scientometrics55,%20123.pdf)

Abstract: The contribution of Turkish researchers to sciences is increasing. Turkish scientists published more than 6.000 articles in 1999 in scientific journals indexed by the Institute for Scientific Information’s Science Citation Index, which puts Turkey to the 25(t)h place in the world rankings in terms of total contribution to science. The number of biomedical publications authored by Turkish scientists is increasing faster than that of engineering and other non-medical sciences, which might be one of the main causes of the steep rise in Turkey’s rankings that we have been witnessing in recent years. More specifically, researchers affiliated with Hacettepe University produce almost a quarter of all the biomedical publications of Turkey that appear in international biomedical literature. In this paper, we report the findings of the bibliometric characteristics (authors and affiliations, medical journals and their impact factors, among others) of a total of 1.434 articles published between 1988 and 1997 by scientists affiliated with Hacettepe University Faculty of Medicine and indexed in MEDLINE, a well-known biomedical bibliographic database.

Keywords: 27 Science Areas, Scientometric Weight, 50 Nations

Rey-Rocha, J., Martiín-Sempere, M.J. and Garzón, B. (2002), Research productivity of scientists in consolidated vs. non-consolidated teams: The case of Spanish university geologists. *Scientometrics*, **55** (1), 137-156.

Full Text: [S\Scientometrics55, 137.pdf](S/Scientometrics55,%20137.pdf)

Abstract: We present some results of an evaluation of research performance of Spanish senior university researchers in Geology. We analyse to what extent productivity of individual researchers is influenced by the level of consolidation of the team they belong to. Methodology is based on the combination of a mail survey carried out among a defined set of researchers, and a bibliometric study of their scientific output. Differences among researchers have been investigated with regard to team size and composition, patterns of publication in domestic and foreign journals, productivity, co-authorship of papers, and impact of publications. Results indicate that not belonging to a research team represents a handicap at the time of publishing in top international journals. Researchers belonging to consolidated teams are more productive than their colleagues in non-consolidated teams, and these in turn more than individuals without team. Team size does not appear to be as important for scientific productivity as the number of researchers within the team that reached a stable job position. Analysis of the impact factor of journals has not revealed differences among researchers with regard to the visibility of their papers.

Keywords: Bibliometric Analysis, Determinants, Size

Farahat, H. (2002), Authorship patterns in agricultural sciences in Egypt. *Scientometrics*, **55** (2), 157-170.

Full Text: [S\Scientometrics55, 157.pdf](S/Scientometrics55,%20157.pdf)

Abstract: This study examines patterns of authorship in nineteen Egyptian journals of agricultural science. Multiple authorship was found to be the predominant trend in the field and co-authored papers accounted for some 79 percent of the sample. The most common form of multiple authorship involved three people. Considerable variation was found among sub-fields and coauthorship was found to be most common in social-science related agricultural disciplines. The author found no significant differences in patterns of collaboration in the agricultural sciences in Egypt and two the other developing countries for which comparative data was available, India and Pakistan.

Dalpé, R. (2002), Bibliometric analysis of biotechnology. *Scientometrics*, **55** (2), 189-213.

Full Text: [S\Scientometrics55, 189.pdf](S/Scientometrics55,%20189.pdf)

Abstract: Although Derwent Biotechnology Abstracts has been used in a variety of bibliometric studies, it has never undergone a systematic examination of its reliability and validity. The objective of this paper is to assess its quality for bibliometric studies attempting to analyse the evolution of biotechnology research, to map leading organizations, and to study the interaction between science and technology. The first part reviews the tools used in bibliometric studies of biotechnology and describes the Derwent Biotechnology Abstracts database. The second part is a case study of plant genetic research, with special emphasis on Canada.

Keywords: Research-and-Development, Patent Statistics, Agricultural Biotechnology, Public Science, US, Indicators, Competition, Government, Technology, Knowledge

Garg, K.C. and Padhi, P. (2002), Scientometrics of laser research in India during 1970-1994. *Scientometrics*, **55** (2), 215-241.

Full Text: [S\Scientometrics55, 215.pdf](S/Scientometrics55,%20215.pdf)

Abstract: An analysis of 952 publications published by Indian scientists and abstracted by *Journal of Current Laser Abstracts* during 1970-1994 indicates that laser research in India picked up during 1978-1994 and reached its peak in 1980. The Indian output in the field of laser research forms an integral part of the mainstream science as reflected by the pattern of publications and their citations in the international literature. Laser research performed in India improved considerably during 1985-1994 as compared to 1970-1984 as seen by different impact indicators such as citation per paper, proportion of high quality papers, and publication effective index. The publication output is concentrated among few institutions and there is a similarity in the activity and attractively profile of the highly productive institutions. India’s citation rate per paper for highly productive authors is at par with the world citation rate per paper. The study indicates that the proportion of mega authored papers increased during 1990-1994 and the international collaboration is mainly with the USA.

Keywords: Activity, Analysis, Citations, Collaboration, Effective, Impact, Index, India, Indicators, Institutions, International Collaboration, Output, Paper, Profile, Publication, Publications, Quality, Research, Science, Similarity, Technology, USA

Goel, K. (2002), Gender differences in publication productivity in psychology in India. *Scientometrics*, **55** (2), 243-258.

Full Text: [S\Scientometrics55, 243.pdf](S/Scientometrics55,%20243.pdf)

Abstract: An analysis of gender differences in psychology in India provides quantitative and qualitative assessment of R&D output contributed by psychologists with the indication of the trend of growth, skewness, relatedness, co-authorship pattern of productivity.

Ponzi, L.J. (2002), The intellectual structure and interdisciplinary breadth of Knowledge Management: A bibliometric study of its early stage of development. *Scientometrics*, **55** (2), 259-272.

Full Text: [S\Scientometrics55, 259.pdf](S/Scientometrics55,%20259.pdf)

Abstract: This study explores the intellectual structure and interdisciplinary breadth of Knowledge Management in its early stage of development. Intellectual structure is established by a principal component analysis applied to an author co-citation frequency matrix. The author co-citation frequencies were derived from the 1994-1998 academic literature and captured by the single search phrase of ‘Knowledge Management.’ Four factors were labeled Knowledge Management, Organizational Learning, Knowledge-based Theories, and The Role of Tacit Knowledge in Organizations. The interdisciplinary breadth surrounding Knowledge Management mainly occurs in the discipline of management. Empirical evidence suggests that the discipline of Computer Science is not a key contributor as originally hypothesized.

Keywords: Co-Citation Analysis, Information, Innovation

Burrell, Q.L. (2002), Modelling citation age data: Simple graphical methods from reliability theory. *Scientometrics*, **55** (2), 273-285.

Full Text: [S\Scientometrics55, 273.pdf](S/Scientometrics55,%20273.pdf)

Abstract: Certain similarities between the types of data reported in retrospective citation analyses and lifetime/survival/reliability models are noted. Graphical techniques much used in reliability analyses are exploited to throw further light on observed citation age distributions and these are then compared and contrasted with previously reported studies. These simple techniques allow systematic departures of empirical data from assumed theoretical models to be highlighted and the models to be compared.

Keywords: Obsolescence

Rousseau, R. (2002), Lack of standardisation in informetric research. Comments on ‘Power laws of research output. Evidence for journals of economics’ by Matthias Sutter and Martin G. Kocher. *Scientometrics*, **55** (2), 317-327.

Full Text: [S\Scientometrics55, 317.pdf](S/Scientometrics55,%20317.pdf)

Abstract: Lack of standard procedures hinders progress in scientometric and bibliometric research. Provoked by a recent publication in the journal Scientometrics, we consider in particular the problem of how to handle - in a standardised way - data that, by and large, follow a Lotka, Zipf or Mandelbrot distribution.

Keywords: Lotka’s Law, Scientific Production, Statistical-Analysis, Distributions, Authors

Glänzel, W., Schubert, A. and Braun, T. (2002), A relational charting approach to the world of basic research in twelve science fields at the end of the second millennium. *Scientometrics*, **55** (3), 335-348.

Full Text: [S\Scientometrics56, 335.pdf](S/Scientometrics56,%20335.pdf)

Keywords: Indicators, Datafiles, Nations

Martín-Sempere, M.J., Rey-Rocha, J. and Garzón-García, B. (2002), The effect of team consolidation on research collaboration and performance of scientists. Case study of Spanish university researchers in Geology. *Scientometrics*, **55** (3), 377-394.

Full Text: [S\Scientometrics56, 377.pdf](S/Scientometrics56,%20377.pdf)

Abstract: We analyse to what extent research collaboration and performance of individual scientists is influenced by the level of consolidation of the team they belong to. A case study of Spanish senior university researchers in Geology is performed. Methodology is based on the combination of a mail survey carried out among a defined set of researchers, and a bibliometric study of their scientific output. Results provide support for the hypothesis that consolidation of research teams would result in a greater facility to establish contacts and collaborations with colleagues, that could benefit all members of the team, fostering their participation in funded projects and favouring their potential to publish in international mainstream journals.

Kim, M.J. (2002), Citation patterns of Korean physicists and mechanical engineers: Differences by type of publication source and type of authorship. *Scientometrics*, **55** (3), 421-436.

Full Text: [S\Scientometrics55, 421.pdf](S/Scientometrics55,%20421.pdf)

Abstract: By comparing the citation patterns of Korean researchers in physics and mechanical engineering, this study identifies the extent to which type of publication source (Korean non-SCI, Korean SCI, and international SCI) and type of authorship (purely Korean authors, Korean-foreign co-authors, and foreign-Korean co-authors) influence the choice of sources cited by Korean scientists. Koreans publishing physics or mechanical engineering papers in international SCI journals are more likely to cite articles published in journals of the science mainstream countries (the U.S., the U.K., the Netherlands, and Germany) than articles published in national journals, while Koreans publishing in Korean journals tend to cite articles published in national journals. In terms of authorship, articles published in mainstream journals are more highly cited by internationally co-authored papers than Korean-authored papers in both disciplines.

Keywords: Behavior, Science, Journals, Place

Kurnaz, E.L. (2002), Observations on the growth characteristics of the research output of Turkish physicists based on a selective citation analysis. *Scientometrics*, **55** (3), 437-444.

Full Text: [S\Scientometrics55, 437.pdf](S/Scientometrics55,%20437.pdf)

Abstract: A comparison has been carried out between the scientific production of Turkish physicists in the periods 1961-1971 and 1994-2000, by considering articles (written singly or in collaboration with scientists of different nationalities) which have received at least ten citations. The results show that in 30 years, appreciable increases have occurred in the number of authors making significant contributions and in the number of papers based on research carried out in Turkey.

Sombatsompop, N., Ratchatahirun, P., Surathanasakul, V., Premkamolnetr, N. and Markpin, T. (2002), A citation report for Thai academic journals published during 1996-2000. *Scientometrics*, **55** (3), 445-462.

Full Text: [S\Scientometrics55, 445.pdf](S/Scientometrics55,%20445.pdf)

Abstract: This article aimed to report Journal Impact Factor (J-IF) and Journal Immediacy Index (J-II) of 68 Thai academic journals during the past five years (from 1996 to 2000) using the calculation method given by the Institute for Scientific Information (ISI). This was the first time that the citation indexes of Thai academic journals were established. With respect to the journal impact factor, the results showed that only six journals have been cited continuously during the past five years, this being 8.8% of the total journal number selected in this work. It was also noticeable that articles published in longer journal age tended to have greater opportunity to be cited and higher journal impact factor. The average impact factor of the 68 journals was relatively low, this being of 0.069, suggesting that the possibility of an article published in a national journal to be cited was only 6.9%. In terms of the immediacy index, it was found that the average immediacy index value was 0.063, which was again very low. No significant relationship between the journal age and the immediacy index could be observed. 47% of the journals have never been able to produce the immediacy index in the past five years, suggesting that articles in the Thai academic journals were hardly cited within the same years they were published.

Braun, T., Szabadi-Peresztegi, Z. and Kovács-Németh, É. (2002), No-bells for ambiguous lists of ranked Nobelists as science indicators of national merit in physics, chemistry and medicine, 1901-2001. *Scientometrics*, **56** (1), 3-28.

Full Text: [S\Scientometrics56, 3.pdf](S/Scientometrics56,%203.pdf)

Keywords: Models

Bharvi, D., Garg, K.C. and Bali, A. (2003), Scientometrics of the international journal Scientometrics. *Scientometrics*, **56** (1), 81-93.

Full Text: [S\Scientometrics56, 81.pdf](S/Scientometrics56,%2081.pdf)

Abstract: An analysis of 1317 papers published in first fifty volumes during 1978 to 2001 of the international journal Scientometrics indicates the heterogeneity of the field with emphasis on scientometric assessment. The study indicates that the US share of papers is constantly on the decline while that of the Netherlands, India, France and Japan is on the rise. The research output is highly scattered as indicated by the average number of papers per institution. The scientometric output is dominated by the single authored papers, however, multi-authored papers are gaining momentum. Similar pattern has been observed for domestic and international collaboration.

Lee, C.K. (2003), A scientometric study of the research performance of the Institute of Molecular and Cell Biology in Singapore. *Scientometrics*, **56** (1), 95-110.

Full Text: [S\Scientometrics56, 110.pdf](S/Scientometrics56,%20110.pdf)

Abstract: This paper describes results of a scientometric study of the Institute of Molecular and Cell Biology (IMCB). The purpose of the study is to evaluate the research performance of IMCB in the first ten years since its establishment. Research inputs and three research outputs - publications, graduate students, and patents filed, are examined. The findings indicate that in the ten years, IMCB produced 395 research papers, 33 book chapters, 24 conference papers, and 4 monographs, graduated 46 PhDs and 14 MScs, and filed 10 patents. In its quest to become world-class, IMCB researchers have been very selective in where they publish - 95.6% of the articles were published in ISI journals. The articles received an average of 25 to 35 citations per article, and the percentage of uncited articles is 11.6%. Four articles received more than 200 citations, and 18 received between 100 to 200 citations.

Stegmann, J. and Grohmann, G. (2003), Hypothesis generation guided by co-word clustering. *Scientometrics*, **56** (1), 111-135.

Full Text: [S\Scientometrics56, 111.pdf](S/Scientometrics56,%20111.pdf)

Abstract: Co-word analysis was applied to keywords assigned to MEDLINE documents contained in sets of complementary but disjoint literatures. In strategical diagrams of disjoint literatures, based on internal density and external centrality of keyword-containing clusters, intermediate terms (linking the disjoint partners) were found in regions of below-median centrality and density. Terms representing the disjoint literature themes were found in close vicinity in strategical diagrams of intermediate literatures. Based on centrality-density ratios, characteristic values were found which allow a rapid identification of clusters containing possible intermediate and disjoint partner terms. Applied to the already investigated disjoint pairs Raynaud ‘s Disease - Fish Oil, Migraine - Magnesium, the method readily detected known and unknown (but relevant) intermediate and disjoint partner terms. Application of the method to the literature on Prions led to Manganese as possible disjoint partner term. It is concluded that co-word clustering is a powerful method for literature-based hypothesis generation and knowledge discovery.

Inönü, E. (2003), The influence of cultural factors on scientific production. *Scientometrics*, **56** (1), 137-146.

Full Text: [S\Scientometrics56, 137.pdf](S/Scientometrics56,%20137.pdf)

Abstract: A classification of countries is made according to respective ranks in the scales of ‘publications per million persons’ and ‘GDP per capita (ppp)’. The result is a clustering of countries which share a common cultural attitude toward scientific research.

Braun, T., Szabadi-Peresztegi, Z. and Kovacs-Nemeth, E. (2003), About Abels and similar international awards for ranked lists of awardees as science indicators of national merit in mathematics. *Scientometrics*, **56** (2), 161-168.

Full Text: [S\Scientometrics56, 161.pdf](S/Scientometrics56,%20161.pdf)

Garg, K.C. (2003), An overview of cross-national, national, and institutional assessment as reflected in the international journal Scientometrics. *Scientometrics*, **56** (2), 169-199.

Full Text: [S\Scientometrics56, 169.pdf](S/Scientometrics56,%20169.pdf)

Abstract: An overview is given of the studies published in the international journal Scientometrics during 1978-2000 on cross-national, national and institutional scientometric assessment.

Tsay, M.Y. and Ma, S.S. (2003), The nature and relationship between the productivity of journals and their citations in semiconductor literature. *Scientometrics*, **56** (2), 201-222.

Full Text: [S\Scientometrics56, 201.pdf](S/Scientometrics56,%20201.pdf)

Abstract: The purpose of this study was to investigate the relationship between journals’ productivity and their citations in the field of semiconductors. Journal samples were gathered from the INSPEC database, 1978 to 1997 while the data of citation frequency, impact factor, cited half-life and citing half-life were obtained from Science Citation Index, Journal Citation Reports 1997 CD-ROM edition. One thousand and eight hundred and seventy seven journals publishing articles on semiconductors were retrieved. The nature for the data of journal productivity, impact factor, cited half-life and citing half-life are explored. Among these journals, only 672 journals that were covered in JCR were compared. Moreover, statistical tests of more productive journals with cumulative publication in semiconductor >100 were also conducted on the basis of all articles they published annually (for 1997). The results of the study showed that there is a significant correlation between journal productivity and citation frequency and between journal productivity and impact factor. However, there are no associations between journal productivity and cited half-life and between journal productivity and citing half-life.

Lee, J.D., Vicente, K.J., Cassano, A. and Shearer, A. (2003), Can scientific impact be judged prospectively? A bibliometric test of Simonton ‘s model of creative productivity. *Scientometrics*, **56** (2), 223-232.

Full Text: [S\Scientometrics56, 223.pdf](S/Scientometrics56,%20223.pdf)

Abstract: Simonton ‘s (1997) model of creative productivity, based on a blind variation-selection process, predicts scientific impact can only be evaluated retrospectively, after recognition has been achieved. We test this hypothesis using bibliometric data from the Human Factors journal, which gives an award for the best paper published each year. If Simonton ‘s model is correct, award winning papers would not be cited much more frequently than non-award winning papers, showing that scientific success cannot be judged prospectively. The results generally confirm Simonton ‘s model. Receipt of the award increases the citation rate of articles, but accounts for only 0.8% to 1.2% of the variance in the citation rate. Consistent with Simonton ‘s model, the influence of the award on citation rate may reflect a selection process of an elite group of reviewers who are representative of the larger peer group that eventually determines the citation rate of the article. Consistent with Simonton ‘s model, author productivity accounts for far more variance in the authors’ total citation rate (58.9%) and in the citation rate of the authors’ most cited article (12.6%) than does award receipt.

Aksnes, D.W. (2003), A macro study of self-citation. *Scientometrics*, **56** (2), 235-246.

Full Text: [S\Scientometrics56, 235.pdf](S/Scientometrics56,%20235.pdf)

Abstract: This study investigates the role of self-citation in the scientific production of Norway (1981-1996). More than 45,000 publications have been analysed. Using a three-year citation window we find that 36% of all citations represent author self-citations. However, this percentage is decreasing when citations are traced for longer periods. We find the highest share of self-citation among the least cited papers. There is a strong positive correlation between the number of self-citations and the number of authors of the publications. Still, only a minor part of the overall increase in citation rates that can be found for multi-authored papers is due to self-citations. Also, the share of self-citation shows significant variations among different scientific disciplines. The results are relevant for the discussion concerning use of citation indicators in research assessments.

Zitt, M., Ramanana-Rahary, S. and Bassecoulard, E. (2003), Correcting glasses help fair comparisons in international science landscape: Country indicators as a function of ISI database delineation. *Scientometrics*, **56** (2), 259-282.

Full Text: [S\Scientometrics56, 259.pdf](S/Scientometrics56,%20259.pdf)

Abstract: The increasing use of bibliometric indicators in science policy calls for a reassessment of their robustness and limits. The perimeter of journal inclusion within ISI databases will determine variations in the classic bibliometric indicators used for international comparison, such as world shares of publications or relative impacts. We show in this article that when this perimeter is adjusted using a natural criterion for inclusion of journals, the journal impact, the variation of the most common country indicators (publication and citation shares, relative impacts) with the perimeter chosen depends on two phenomena. The first one is a bibliometric regularity rooted in the main features of competition in the open space of science, that can be modeled by bibliometric laws, the parameters of which are ‘coverage- independent’ indicators. But this regularity is obscured for many countries by a second phenomenon, the presence of a sub-population of journals that does not reflect the same international openness, the nationally- oriented journals. As a result indicators based on standard SCI or SCISearch perimeters are jeopardized to a certain extent by this sub-population which creates large irregularities. These irregularities often lead to an over-estimation of share and an under-estimation of the impact, for countries with national editorial tradition, while the impact of a few mainstream countries arguably benefits from the presence of this sub-population.

Keywords: Cross-Field Normalization, Scientific Journals, Citation-Index, Distributions, Publication, Model, Performance, Society, Impact, SCI

Drenth, J.P.H. (2003), More reprint requests, more citations? *Scientometrics*, **56** (2), 283-286.

Full Text: [S\Scientometrics56, 283.pdf](S/Scientometrics56,%20283.pdf)

Abstract: Reprint requests are commonly used to obtain a copy of an article. This study aims to correlate the number of reprint requests from a 10-year-sample of articles with the number of citations. The database contained 28 articles published in over a 10-year-period (1992-2001). For each separate article the number of citations and and the number of reprint requests were retrieved. In total 303 reprint requests were analysed. Reviews (median 9, range 1 to 95) and original articles (median 8, range 1-36) attracted most reprint requests. There was an excellent correlation between the number of requests and citations to article (two-tailed non-parametric Spearman rank test r = 0.55, 95% confidence interval 0.18-0.78, P < 0.005). Articles that received most reprint requests are cited more often.

Schloegl, C., Gorraiz, J., Bart, C. and Bargmann, M. (2003), Evaluating two Austrian university departments: Lessons learned. *Scientometrics*, **56** (3), 287-299.

Full Text: [S\Scientometrics56, 287.pdf](S/Scientometrics56,%20287.pdf)

Abstract: This paper describes various problems which may occur in quantitative research evaluation. It is shown that problems already arise when trying to define such seemingly simple scientometric elements as ‘personnel’ or ‘budget’. This has major consequences on the construction of indicators. Furthermore, it is demonstrated that different data sources as well as different data and indicators result in different, sometimes even contradicting outcomes.

Keywords: Indicators

Hayashi, T. (2003), Bibliometric analysis on additionality of Japanese R&D programmes. *Scientometrics*, **56** (3), 301-316.

Full Text: [S\Scientometrics56, 301.pdf](S/Scientometrics56,%20301.pdf)

Abstract: To justify public investment in R&D activities especially those conducted by private companies, the effect to change their behavior into what could not be realized without public funds is required. This paper studies the ‘additionality’ of Japanese R&D programmes by analyzing the patent applications of five case study projects. Changes and continuations in research themes between the results of the project and the results in five years before and after the project were measured using a similarity index. Also, the similarities between research groups in a project were measured. These show how each project was constituted by researchers with various types of knowledge. As a result, although all projects contained core research groups who continued their research in the project, the effect of mobilizing other researchers into new fields was shown to vary depending on the characteristics of the projects.

Keywords: Science

Figueira, I., Jacques, R. and Leta, J. (2003), A comparison between domestic and international publications in Brazilian psychiatry. *Scientometrics*, **56** (3), 317-327.

Full Text: [S\Scientometrics56, 317.pdf](S/Scientometrics56,%20317.pdf)

Abstract: This article assesses the Brazilian psychiatric production and compares the numbers of articles published between 1981 and 1995 in Brazilian domestic journals and published in international journals. From the total number of articles analyzed, 87.2% were published in domestic journals. These probably will never reach the international scientific community. From the articles published in Brazil, 56.8% were review and opinion articles, while from the articles published in international journals, 69.8% were research articles. Publications in both Brazilian and international journals included few prospective research studies and research reports dealing with bipolar disorder and cocaine use. On the other hand, alcohol use disorder and major depressive disorder were the most commonly studied clinical fields published both in domestic and in international psychiatric journals.

Keywords: Journals

Ugolini, D. and Casilli, C. (2003), The visibility of Italian journals. *Scientometrics*, **56** (3), 345-355.

Full Text: [S\Scientometrics56, 345.pdf](S/Scientometrics56,%20345.pdf)

Abstract: The main purpose of this study was to analyze the Italian journals indexed in the 2000 edition of the Journal Citation Reports (JCR) published by the Institute for Scientific Information (ISI) (Philadelphia, USA). The performance and the visibility of these journals were evaluated in terms of Impact Factor (IF), mean IF from citing journals and cited journals, and self-citing and self-cited rates.

Seventy-three Italian journals were indexed in the JCR, 14 of which achieved an IF equal to or higher than one. Most citing journals were European and American, thus showing a fairly good visibility of the articles published in the 14 journals analyzed. The self-citing and self-cited rates showed a wide variation. The journal that appeared to perform best was the Journal of High Energy Physics, an electronic publication whose success seemingly confirms Internet circulation as an effective means to enhance the visibility and consequently the quality, in term of citations, of a journal.

Italy’s low overall expenditure on research & development (R&D) and low number of researchers compared to countries with longstanding high publishing standards and traditions are no doubt partly to blame for its poor performance in scientific publishing.

Keywords: Impact

? Glänzel, W. and Schubert, A. (2003), A new classification scheme of science fields and subfields designed for scientometric evaluation purposes. *Scientometrics*, **56** (3), 357-367.

Full Text: [2003\Scientometrics56, 357.pdf](2003/Scientometrics56,%20357.pdf)

Abstract: A two-level hierarchic system of fields and subfields of the sciences, social sciences and arts & humanities is proposed. The system was specifically designed for scientometric (evaluation) purposes with the ultimate goal of classifying every single document into a well-defined category. This goal was achieved using a three-step iterative process. The basic concepts and some preliminary results are presented.

Keywords: Item Subject Classification

Al-Qallaf, C.L. (2003), Citation patterns in the Kuwaiti journal Medical Principles and Practice: The first 12 years, 1989-2000. *Scientometrics*, **56** (3), 369-382.

Full Text: [S\Scientometrics56, 369.pdf](S/Scientometrics56,%20369.pdf)

Abstract: This study investigates the citation patterns in the journal, Medical Principles and Practice from its inception in 1989 through 2000 (volumes 1-9). The data set includes 4740 references appended to the 221 original research articles. All of the citations were entered into a ProCite database for analysis. Specifically, this study addresses: (1) bibliometric patterns of cited works in terms of publication format, subject scatter, authorship characteristics, age of citations, geographic distribution, and language distribution, (2) productivity of journal titles, (3) the role of self-citation, and (4) how selected bibliometric indicators apply. Some of the findings include: journal articles are most frequently cited, English language publications dominate the literature, there is a trend of multiple authorship, and the pattern of aging is below the norm for medical literature. The results of the study can provide a benchmark to measure the user behavior of a particular group of researchers as well as for the provision of collection development and management decisions.

Keywords: Reference Accuracy, Biologists

Thelwall, M., Tang, R. and Price, L. (2003), Linguistic patterns of academic Web use in Western Europe. *Scientometrics*, **56** (3), 417-432.

Full Text: [S\Scientometrics56, 417.pdf](S/Scientometrics56,%20417.pdf)

Abstract: A survey of linguistic dimensions of Web site hosting and interlinking of the universities of sixteen European countries is described. The results show that English is the dominant language both for linking pages and for all pages. In a typical country approximately half the pages were in English and half in one or more national languages. Normalised interlinking patterns showed three trends: 1) international interlinking throughout Europe in English, and additionally in Swedish in Scandinavia, 2) linking between countries sharing a common language, and 3) countries extensively hosting international links in their own major languages. This provides evidence for the multilingual character of academic use of the Web in Western Europe, at least outside the UK and Eire. Evidence was found that Greece was significantly linguistically isolated from the rest of the EU but that outsiders Norway and Switzerland were not.

Keywords: Bibliometrics, Information, Webometrics

Tsay, M.Y., Xu, H. and Wu, C.W. (2003), Journal co-citation analysis of semiconductor literature. *Scientometrics*, **57** (1), 7-25.

Full Text: [S\Scientometrics57, 7.pdf](S/Scientometrics57,%207.pdf)

Abstract: The purpose of this study is to map semiconductor literature using journal co-citation analysis. The journal sample was gathered from the INSPEC database from 1978 to 1997. In the co-citation analysis, the data compiled were counts of the number of times two journal titles were jointly cited in later publications. It is assumed that the more two journals are cited together, the closer the relationship between them. The journal set used was the 30 most productive journals in the field of semiconductors. Counts of co-citations to the set of semiconductor journals were retrieved from SciSearch database, accessed through Dialog. Cluster analysis and multi-dimensional scaling were employed to create two-dimensional maps of journal relationships in the cross-citation networks. The following results were obtained through this co-citation study: The 30 journals fall fairly clearly into three clusters. The major cluster of journals, containing 17 titles, is in the subject of physics. The second cluster, consisting of 9 journals, includes journals primarily on material science. The remaining cluster represents research areas in the discipline of electrical and electronic engineering. All co-cited journals share similar co-citation profiles, reflected in high positive Pearson correlation. Two hundred and ninety-six pairs (68%) correlate at greater than 0.70. This shows that there is strong relationship between semiconductor journals. Five individual journals in five paired sets with co-citation frequency over 100,000 times include *Physical Review B*, *Condensed Matter*, *Physical Review Letters*, *Applied Physics Letters*, *Journal of Applied Physics*, and *Solid State Communications*.

Gupta, B.M. and Dhawan, S.M. (2003), India’s collaboration with People’s Republic of China in Science and Technology: A scientometric analysis of coauthored papers during 1994-1999. *Scientometrics*, **57** (1), 59-74.

Full Text: [S\Scientometrics57, 59.pdf](S/Scientometrics57,%2059.pdf)

Abstract: The paper describes the need and importance of collaboration on scientific research. It discusses the present status of India’s collaboration with China in S&T, analyses the collaborative research between India and China, as reflected in the co-authored papers, in particular its nature, strong and week areas and its impact in different subject fields and indicates the potential areas in S&T for future collaboration.

Zitt, M., Ramanana-Rahary, S. and Bassecoulard, E. (2003), Bridging citation and reference distributions: Part I - The referencing-structure function and its application to co-citation and co-item studies. *Scientometrics*, **57** (1), 93-118.

Full Text: [S\Scientometrics57, 93.pdf](S/Scientometrics57,%2093.pdf)

Abstract: Citations networks are a core topic of informetrics and science studies. This article proposes to bridge the cited and citing side of citation transactions by using a disaggregated form, the ‘referencing-structure’ function (RSF). The RSF may be also seen as the ‘retrieval-structure’ which, in a stylized co-citation or co-word model, gives the maximum retrieval that can be expected from the bibliometric characteristics of the field (retrieval and recall features are key issues in co-citation studies). The usual citation and reference distributions may be derived from aggregates or cuts respectively, of the RSF. The RSF representation also generates new points of views on the citing-cited distributions, such as the ‘iso-retrieval function’. A rank version of RSF is also introduced.

Part I is devoted to the definition and construction of the RSF, and to the general interpretation of its various aspects in the context of co-citation studies. Generalization to other co-item (co-word, hyperlinks’ co-sitations’) studies is discussed briefly. We also introduce a general form kindred to the Weibull distribution that can be used to fit cuts of the function. The forthcoming Part II will detail empirical fits, using a few experimental files.

Keywords: Science

Li, L. and Zhang, F.L. (2003), Developing English-language academic journals of China. *Scientometrics*, **57** (1), 119-125.

Full Text: [S\Scientometrics57, 119.pdf](S/Scientometrics57,%20119.pdf)

Abstract: Many academic journals of China began to be published in English when China opened door to the world more than 20 years ago. Tsinghua University started to publish an academic journal, the *Tsinghua Science and Technology* since 1996. We made statistical analyses on the regional distribution on the authors and of the references cited by the articles of *Tsinghua Science and Technology* from 1996 to 2002. The results show that although the authors are mainly from the Tsinghua University, the number of authors from other regions, especially the number of overseas authors, are increasing in recent years, the average number of references cited by every article are increasing from 6.9 in 1996 to 13.4 in 2002. The results suggest that we must learn the successful experiences from well-known journals. Attracting high-level articles and realizing the internationalization of the journal will help us to develop the journal.

He, T.W. (2003), Difficulties and challenges of Chinese scientific journals: Statistical analysis of Chinese literatures using *Chinese Science Bulletin* as example. *Scientometrics*, **57** (1), 127-139.

Full Text: [S\Scientometrics57, 127.pdf](S/Scientometrics57,%20127.pdf)

Abstract: Using statistical method, the author analyzed the citation rate of articles published in *Chinese Science Bulletin* (CSB) between 1995 and 1999 in *Science Citation Index Expanded* (SCIE) databases. Results indicated that: 1. Majority of authors who published in CSB were Chinese, 2. The articles were basically cited by the authors themselves in the first year after publication, 3. The peak of total citation rate appeared in the third year after publication and the peak of non-self-citation rate was further delayed. There are relatively high self-citation rates of articles from CSB and most of these citations are from Chinese scientific journals. This indicates that our citation environment is limited to a closed circle. The author, therefore, proposed a strategy for changing the current conditions of Chinese scientific journals to raise their influence.

Keywords: Analysis, Chinese, Citations, Current, Databases, Environment, Impact Factors, Publication, Publications, Science Citation Index, Strategy

Bordons, M., Morillo, F., Fernandez, M.T. and Gomez, I. (2003), One step further in the production of bibliometric indicators at the micro level: Differences by gender and professional category of scientists. *Scientometrics*, **57** (2), 159-173.

Full Text: [2003\Scientometrics57, 159.pdf](2003/Scientometrics57,%20159.pdf)

Abstract: Productivity and impact of the Spanish Council for Scientific Research scientists in Natural Resources and Chemistry by gender and professional category are analysed. Scientific publications were downloaded from the Science Citation Index, years 1994-1999. A total of 260 Natural Resources scientists (24% of females) and 219 Chemistry ones (38% of females) were studied. Productivity tended to increase as professional category improved in the two areas. Within each category no significant differences in productivity were found between genders, but the outliers with the highest production were mostly males. Distribution of females by professional categories and number of years at the institution were analysed to detect possible gender discrimination in the promotion system. A more positive picture e merges in Chemistry than in Natural Resources, since a process of feminization of that area has started in the lowest professional categories and females’ progression to the upper ranks is expected in the near future.

Keywords: Sex-Differences, Women, Science

Glänzel, W., Danell, R. and Persson, O. (2003), The decline of Swedish neuroscience: Decomposing a bibliometric national science indicator. *Scientometrics*, **57** (2), 197-213.

Full Text: [2003\Scientometrics57, 197.pdf](2003/Scientometrics57,%20197.pdf)

Abstract: Recent studies have reported on a steady decline of Sweden’s relative citation impact in almost all science fields, above all in the life sciences. The authors attempt to shed light on the observed decline in Swedish neuroscience through a detailed citation analysis at different level of aggregations. Thus national citation data are de composed to the institutional, departmental and individual level. Both, the decomposition of national science indicators and changing collaboration patterns in Swedish neuroscience reveal interesting details on the ‘anatomy’ of a decline.

Laudel, G. (2003), Study the brain drain: Can bibliometric methods help? *Scientometrics*, **57** (2), 215-237.

Full Text: [S\Scientometrics57, 215.pdf](S/Scientometrics57,%20215.pdf)

Abstract: Today science policy makers in many countries worry about a brain drain, i.e., about permanently losing their best scientists to other countries. However, such a brain drain has proven to be difficult to measure. This article reports a test of bibliometric methods that could possibly be used to study the brain drain on the micro-level. An investigation of elite mobility must solve the three methodological problems of delineating a specialty, identifying a specialty’s elite and identifying international mobility and migration. The first two problems were preliminarily solved by combining participant lists from elite conferences (Gordonconferences) and citation data. Mobility was measured by using the address information of publication data bases. The delineation of specialties has been identified as the crucial problem in studying elite mobility on the micro-level. Policy concerns of a brain drain were confirmed by measuring the mobility of the biomedical Angiotensin specialty.

Keywords: Geographic-Mobility, Scientists, Science

van Leeuwen, T.N., Visser, M.S., Moed, H.F., Nederhof, T.J. and van Raan, A.F.J. (2003), The Holy Grail of science policy: Exploring and combining bibliometric tools in search of scientific excellence. *Scientometrics*, **57** (2), 257-280.

Full Text: [S\Scientometrics57, 257.pdf](S/Scientometrics57,%20257.pdf)

Abstract: Evaluation studies of scientific performance conducted during the past years more and more focus on the identification of research of the ‘highest quality’, ‘top’ research, or ‘scientific excellence’. This shift in focus has lead to the development of new bibliometric methodologies and indicators. Technically, it meant a shift from bibliometric impact scores based on average values such as the average impact of all papers published by some unit to be evaluated towards indicators reflecting the top of the citation distribution, such as the number of ‘highly cited’ or ‘top’ articles.

In this study we present a comparative analysis of a number of standard and new indicators of research performance or ‘scientific excellence’, using techniques applied in studies conducted by CWTS in recent years. It will be shown that each type of indicator reflects a particular dimension of the general concept of research performance. Consequently, the application of one single indicator only may provide an incomplete picture of a unit’s performance. It is argued that one needs to combine the various types of indicators in order to offer policy makers and evaluators valid and useful assessment tools.

Keywords: Indicators

Leta, J. and Lewison, G. (2003), The contribution of women in Brazilian science: A case study in astronomy, immunology and oceanography. *Scientometrics*, **57** (3), 339-353.

Full Text: [S\Scientometrics57, 339.pdf](S/Scientometrics57,%20339.pdf)

Abstract: The performance of Brazilian male and female scientists in three scientific fields was assessed through their publications in the Science Citation Index from 1997-2001. Information on their sex and their ages, positions, and fellowship status was obtained from a census on all Brazilian scientists. The results showed that women participated most in immunology, moderately in oceanography and least in astronomy. Men and women published similar numbers of papers, and they were also of similar potential impact, they were also equally likely to collaborate internationally their salaries, suggesting that some sexual discrimination may still be occurring in the Brazilian peer- review process.

Keywords: Europe, International Collaboration, Scientific Cooperation

Ho, Y.S., Chiu, C.H., Tseng, T.M. and Chiu, W.T. (2003), Assessing stem cell research productivity. *Scientometrics*, **57** (3), 369-376.

Full Text: [S\Scientometrics57, 369.pdf](S/Scientometrics57,%20369.pdf)

Abstract: Honour Index (HoI), a method to evaluate research performance within different research fields, was derived from the impact factor (IF). It can be used to rate and compare different categories of journals. HoI was used in this study to determine the scientific productivity of stem cell research in the Asian Four Dragons (Hong Kong, Singapore, South Korea and Taiwan) from 1981 to 2001. The methodology applied in this study represents a synthesis of universal indicator studies and bibliometric analyses of subfields at the micro-level. We discuss several comparisons, and conclude the developmental trend in stem cell research for two decades.

Keywords: Analyses, Asian, Bibliometric, Bibliometric Analyses, Fields, Hong Kong, Impact, Impact Factor, Indicator, Journals, Korea, Methodology, Performance, Productivity, Publications, Research, Research Performance, Research Productivity, Science, Scientific Productivity, Singapore, South Korea, Stem Cell, Synthesis, Taiwan, Trend

Miettunen, J. and Nieminen, P. (2003), The effect of statistical methods and study reporting characteristics on the number of citations: A study of four general psychiatric journals. *Scientometrics*, **57** (3), 377-388.

Full Text: [S\Scientometrics57, 377.pdf](S/Scientometrics57,%20377.pdf)

Abstract: This paper investigates how the use of different statistical methods and study design characteristics affected the number of citations in psychiatric journals. Original research articles (N=448) from four psychiatric journals were reviewed. Aspects measured included the use of statistical methodology, presentation of results, description of procedures, country of the corresponding author and number of the authors. The use of statistical methods was not strongly associated with the further utilisation of an article. The effect was low compared to the impact of correspondence address or number of authors. Extended description of statistical procedures and an experimental study design had a positive effect to the received citations.

Keywords: Medical Journals, Trends

Xu, W., Chen, Y.Z. and Shen, Z.C. (2003), Neuroscience output of China: A MEDLINE-based bibliometric study. *Scientometrics*, **57** (3), 399-409.

Full Text: [S\Scientometrics57, 399.pdf](S/Scientometrics57,%20399.pdf)

Abstract: Neuroscience is one of the most active research fields in many countries including China, an economically and scientifically emerging country, where a rapid development has been occurred since the 1970s. In this study, a MEDLINE-based bibliometric analysis of Chinese international output in neuroscience was conducted for the period from 1984 through 2001. An attempt was made to identify the pattern of the growth and to obtain some quantitative indicators over the literature studied in order to review at the developing steps of neuroscience in China during the period.

Wallner, B., Fieder, M. and Iber, K. (2003), Age profile, personnel costs and scientific productivity at the University of Vienna. *Scientometrics*, **58** (1), 143-153.

Full Text: [S\Scientometrics58, 143.pdf](S/Scientometrics58,%20143.pdf)

Abstract: This study analyzes the age profile of scientific employees and its relation to personnel costs and scientific productivity within eight faculties at the University of Vienna. The age demography can overall be divided into two main categories: Category one faculties represent an increased number of younger aged researchers (Catholic-, Protestant Theology, Law, Economics, Information Sciences, and Medicine), category two faculties show an increased number of older aged researchers (Social Sciences, Humanities, and Science). In addition, it can be demonstrated that the personnel costs for full professors are higher within four faculties (Catholic-, Protestant Theology, Law, and Economics and Information Sciences). Inevitably, this leads to savings for habilitated and non- habilitated researchers at these faculties. The faculty of Medicine represents a well-balanced use of personnel costs. Three faculties (Social Sciences, Humanities, and Sciences) have to pay dramatically more for their older aged habilitated and non-habilitated personnel. For the entire university and two faculties, Medicine and Humanities, a positive and significant relationship between age and the average weekly teaching performance is shown. This study suggests that institutions with a high percentage of older researchers, mainly in the categories of habilitated and non- habilitated personnel, must change their policy to become more flexible and attractive for new talented young people. Due to the fact, that this cannot only be realized through the introduction of new laws, each faculty must establish a scientific plan combined with reorganizations of the personnel structure and personnel costs.

Thelwall, M. and Tang, R. (2003), Disciplinary and linguistic considerations for academic Web linking: An exploratory hyperlink mediated study with Mainland China and Taiwan. *Scientometrics*, **58** (1), 155-181.

Full Text: [S\Scientometrics58, 155.pdf](S/Scientometrics58,%20155.pdf)

Abstract: The Web has become an important means of academic information exchange and can be used to give new insights into patterns of informal scholarly communication. This study develops new methods to examine patterns of university Web linking, focusing on Mainland China and Taiwan, and including language considerations. Multiple exploratory investigations into Web links were conducted between universities in these two places. Firstly, inlinks were counted to each university Web site from its national peers using four alternative Web document models. The results were shown to correlate significantly with research productivity in Taiwan but not in the Mainland, although in the latter case less reliable institutional data could have been the cause. For Taiwan, this is the first evidence of a scholarly association with academic linking for a non-English speaking region. It was then ascertained that the same link counts associated more strongly with scientific than social scientific research productivity in Taiwan. This confirms the general assumption of greater Web use by the hard sciences. We then investigated Taiwan-Mainland university cross-links, and found that although English is extensively used on the Web, there was no evidence that it was the language of preference for informal scholarly communication between the two areas.

Keywords: Bibliometrics, Communication, Crawler, Departments, Impact Factors, Information, Journals, Science, Site Interlinking, University

Hullmann, A. and Meyer, M. (2003), Publications and patents in nanotechnology - An overview of previous studies and the state of the art. *Scientometrics*, **58** (3), 507-527.

Full Text: [S\Scientometrics58, 507.pdf](S/Scientometrics58,%20507.pdf)

Abstract: Nanotechnology and the sciences that are associated with it have attracted much attention. Experts from various fields believe that nanotechnology will be one of the key technologies affecting almost every aspect of the economy. While there are considerable efforts underway that aim to commercialise nanotechnology - carried by start-up companies as well as large internationally operating firms - most of the activity seems to focus on research and development activities. There have been a number of technology studies and investment reports that describe the opportunities associated with this emerging area. Over the years there have also been a number of bibliometric and patent studies that examined the field. This paper provides an overview of measuring nanotechnology with commonly used indicators of bibliometric and patent analyses.

Keywords: Technology, Science, Field

Glänzel, W., Schlemmer, B. and Thijs, B. (2003), Better late than never? On the chance to become highly cited only beyond the standard bibliometric time horizon. *Scientometrics*, **58** (3), 571-586.

Full Text: [2003\Scientometrics58, 571.pdf](2003/Scientometrics58,%20571.pdf)

Abstract: According to GARFIELD (1980), most scientists can name an example of an important discovery that had little initial impact on contemporary research. And he uses by Mendel’s work as a classical example. Delayed recognition is sometimes used by scientists as an argument against citation-based indicators based on citation windows defined for a short- or medium-term initial period beginning with the paper’s publication year.

This study is focussed on a large-scale analysis of the citation history of all papers indexed in the 1980 annual volume of the Science Citation Index. The objective is two-fold, particularly, to analyse whether the share of delayed recognition papers is significant and whether such papers are typical of the work of their authors at that time.

In a first step, the background of advanced bibliometric models by Glänzel, Egghe, Rousseau and Burrell of stochastic citation processes and first-citation distributions is described briefly. The second part is devoted to the bibliometric analysis of first-citation statistics and of the phenomenon of citation delay. In a third step, finally, delayed reception publications have been studied individually. Their topics and the citation patterns of other papers by the same authors have been studied to uncover principles of regularity or exceptionality of delayed reception publications.

Keywords: Scientific Literature, Citation Processes, Stochastic-Model

? Vinkler, P. (2003), Relations of relative scientometric indicators. *Scientometrics*, **58** (3), 687-694.

Full Text: [2003\Scientometrics58, 687.pdf](2003/Scientometrics58,%20687.pdf)

Abstract: Relative indicators are preferably used for the comparative evaluation of thematically different sets of journal papers. The Relative Publication Strategy and Relative Subfield Citedness (RPS/RW) function referring to a set of papers selected was found to be identical with the Mean Expected Citation Rate and Mean Observed Citation Rate (MECR/MOCR) function.

Keywords: Citation, Citedness, Evaluation, Impact, Indicators, Journal, Performance, Publication, Publication Output, Scientometric Indicators, World

? Albert, A. and Plaza, L.M. (2004), The transfer of knowledge from the Spanish public R&D system to the productive sectors in the field of Biotechnology. *Scientometrics*, **59** (1), 3-14.

Full Text: [2004\Scientometrics59, 3.pdf](2004/Scientometrics59,%203.pdf)

Abstract: To determine the capability and resources of the Spanish R & D system to produce knowledge useful for the Biotechnology industries, an analysis of indicators derived from published work, scientific papers cited in US patents and inventions patented, has been carried out. The results show that the number of publications compares well with that of other European countries. The visibility of those publications seems evident as about two thirds of the authors studied have been cited in patents assigned to foreign enterprises, but very few of them have applied for patents. This is analysed in connection with the existing policies.

Keywords: Analysis, Authors, Biotechnology, Flows, Indicators, Industries, Innovation, Knowledge, Papers, Patents, Policies, Publications, Science, Technology, US, Visibility

Dastidar, P.G. (2004), Ocean Science & Technology research across the countries: A global scenario. *Scientometrics*, **59** (1), 15-27.

Full Text: [2004\Scientometrics59, 15.pdf](2004/Scientometrics59,%2015.pdf)

Abstract: In this paper attempt has been made to unfold the intellectual base in ocean science and technology. The articles appeared in Science Citation Index (SCI) under Oceanography in the year 2000 were analyzed to decipher the scientist to scientist, organization to organization and country to country network structures. The causal linkages between the knowledge productivity function and the socio-economic imperatives of knowledge production units were studied.

Keywords: Ocean, Science, Marine Engineering, Scientometrics, Policy, Bibexcel, Ucinet, Network Analysis, Centrality, Research, Dynamics

? Bar-Ilan, J. (2004), Self-linking and self-linked rates of academic institutions on the Web. *Scientometrics*, **59** (1), 29-41.

Full Text: [2004\Scientometrics59, 29.pdf](2004/Scientometrics59,%2029.pdf)

Abstract: In this paper we introduce two measures self-linked and self-linking that are the analogues of self-citing and self-cited rates for scientific journals. These rates are calculated for a sample of sites to assess their meaning and utility. Self-linked is the more meaningful measure for the sample sites. As a first step towards a better understanding of self-linking (linking within a site), a sample of pages from an academic site was characterized using the method of content analysis. Even though most of the links serve navigational or other technical purposes, the percentage of content-bearing links among the self-links is significant, and even the portion of research oriented links is non-negligible.

Keywords: Analysis, Bibliometrics, Citation, Content Analysis, Impact Factors, Information, Journals, Research, Scientific Journals, Sites

? Ajiferuke, I. and Wolfram, D. (2004), Modelling the characteristics of Web page outlinks. *Scientometrics*, **59** (1), 43-62.

Full Text: [2004\Scientometrics59, 43.pdf](2004/Scientometrics59,%2043.pdf)

Abstract: Using data sampled from top-level Web pages across five high-level domains and from sample pages within individual websites, the authors investigate the frequency distribution of outlinks in Web pages. The observed distributions were fitted to different theoretical distributions to determine the best-fitting model for representing outlink frequency across Web pages. Theoretical models tested include the modified power law (MPL), Mandelbrot (MDB), generalized Waring (GW), generalized inverse Gaussian-Poisson (GIGP), and generalized negative binomial (GNB) distributions. The GIGP and GNB provided good fits for data sets for top-level pages across the high level domains tested, with the GIGP performing slightly better. The lumpiness and bimodal nature of two of the observed outlink distributions from Web pages within a given website resulted in poor fits of the theoretical models. The GIGP was able to provide better fits to these data sets after the top components were truncated. The ability to effectively model Web page attributes, such as the distribution of the number of outlinks per page, paves the way for simulation models of Web page structural content, and makes it possible to estimate the number of outlinks that may be encountered within Web pages of a specific domain or within individual websites.

Keywords: Authors, Frequency, Generalized Waring Distribution, Internet, Model, Modified, Power, Search Engines, Simulation, Theoretical Models, Websites, World-Wide-Web

? Glänzel, W., Thijs, B. and Schlemmer, B. (2004), A bibliometric approach to the role of author self-citations in scientific communication. *Scientometrics*, **59** (1), 63-77.

Full Text: [2004\Scientometrics59, 63.pdf](2004/Scientometrics59,%2063.pdf)

Abstract: The present paper analyses the role of author self-citations aiming at finding basic regularities of self-citations within the process of documented scientific communication and thus laying the methodological groundwork for a possible critical view at self-citation patterns in empirical studies at any level of aggregation. The study consists of three parts, the first part of the study is concerned with the comparative analysis of the ageing of self-citations and of non-self citations, in the second part the possible interdependence between self-citations and foreign citations is analysed and in the third part the interrelation of the share of self-citations in all citations with other citation-based indicators is studied. The outcomes of this study are two-fold, first, the results characterise author self-citations - at least at the macro level - as an organic part of the citation process obeying rules that can be measured and described with the help of mathematical models. Second, these rules can be used in evaluative micro and meso analyses to identify significant deviations from the reference standards.

? Kim, K. (2004), The motivation for citing specific references by social scientists in Korea: The phenomenon of co-existing references. *Scientometrics*, **59** (1), 79-93.

Full Text: [2004\Scientometrics59, 79.pdf](2004/Scientometrics59,%2079.pdf)

Abstract: This study, based on the premise that references are a social product that reflects the social environment of a society, is an attempt to explore the co-existence of Korean and non-Korean literature in the references to Korean papers. 321 authors (papers) who published in 43 issues of 24 Korean journals focused on the social sciences were surveyed about their research channels and citation motivations, and the 11,358 references in the papers were analyzed. The findings were as follows : (1) The extent of the co-existence was that non-Korean literature was cited 1.9 times (65.3%) more often than Korean literature; (2) Research channel was the most common non-Korean channel orientation (55.8%); (3) The motivation for citations was significantly dependent on whether the literature cited was Korean or non-Korean. Non-Korean literature was chiefly cited for conceptual (20.7%), perfunctory (16.0%), and persuasive (15.1%) motivations; (4) The citations and citation motivations behind non-Korean literature were significantly influenced by research channel, discipline, focus of research, publishing career, and type of paper. Of these variables, research channel was frequently related to the citation of non-Korean literature. Finally, this study is very suggestive on two counts: (1) Citation motivation might constitute a new approach for exploring the production of knowledge by researchers. (2) This study has demonstrated, in particular, an empirical relationship between knowledge produced by Korean social scientists and non-Korean knowledge through the analysis of citation motivation.

Keywords: Analysis, Authors, Citation, Citations, Classification, Environment, Indicators, Journals, Knowledge, Literature, Model, Motivation, Papers, Publishing, Research, Researchers, Sciences, Social, Social Environment, Social Sciences, Social Scientists

? Rey-Rocha, J. and Martin-Sempere, M.J. (2004), Patterns of the foreign contributions in some domestic vs. international journals on Earth Sciences. *Scientometrics*, **59** (1), 95-115.

Full Text: [2004\Scientometrics59, 95.pdf](2004/Scientometrics59,%2095.pdf)

Abstract: Patterns of the foreign contributions published in six scientific journals on Earth Sciences published in different countries, have been studied as an approach for testing their level of internationalisation. Two of the multiple dimensions that determine the internationalisation of scientific journals are considered: the geographical distribution pattern of authors and the co-authorship linkages among them. The potential of the said journals to attract manuscripts by foreign authors and to promote international collaboration, through the publishing of co-authored papers involving or not scientists by its own country of publication, is investigated. Some other indicators on the degree of internationalisation of scientific journals, such as, language of publication, publishing institution, and national structure of editorial boards, are also considered. Finally, the geographic areas, the journal papers deal with, can be introduced as a new aspect of internationalisation. Three categories of journals clearly differentiated are identified and characterised: domestic, regional and international journals. The effect on publication and collaboration patterns, of geopolitical, cultural, economic and linguistic bonds among countries is discussed. The important role of domestic European journals on Earth Sciences is noted, as they are not only the main information source on the research carried out by local scientists whose study is focused on the geologic features of their country, but also, as an excellent vehicle of international diffusion for works by foreign scientists from developing countries. On the other hand, international collaborative articles in domestic journals constitute an indicator of the interest of the international community on the scientific studies in the publishing country.

Keywords: Authors, Citation, Co-Authorship, Coauthorship, Collaboration, Cooperation, Developing Countries, Diffusion, Geographically-Oriented Disciplines, Hand, Information, Interest, International Collaboration, Internationalisation, Journal, Journals, Papers, Publication, Publishing, Quality, Research, Sciences, Scientific Journals

Robert, C., Arreto, C.D., Azerad, J. and Gaudy, J.F. (2004), Bibliometric overview of the utilization of artificial neural networks in medicine and biology. *Scientometrics*, **59** (1), 117-130.

Full Text: [S\Scientometrics59, 117.pdf](S/Scientometrics59,%20117.pdf)

Abstract: The distribution of articles involving artificial neural networks (ANN) in the fields of medicine and biology and appearing in the ISI (Institute for Scientific Information) databases during the period 2000-2001 was analysed. The following parameters were considered: the number of articles, the total impact factor, the ISI journal category, the source country population, and the gross domestic product. Among the 803 articles and the 49 countries considered, the 5 most prolific (in term of the number of publications) were the USA, The United Kingdom, Germany, Italy, and Canada, other active countries included Sweden, Netherlands, Spain, France, Japan, and China. Comparison between the USA and the European Union, and the distribution of ANN publications among the subdisciplines of the life sciences and clinical medicine are also presented.

Keywords: European-Union

? Guan, J.C. and Wang, J.X. (2004), Evaluation and interpretation of knowledge production efficiency. *Scientometrics*, **59** (1), 131-155.

Full Text: [2004\Scientometrics59, 131.pdf](2004/Scientometrics59,%20131.pdf)

Abstract: We propose an improved Data Envelopment Analysis (DEA) model to evaluate the efficiency of research groups in the area of information science in PR China. By taking the research groups as Decision Making Units (DMUs), the budget of the projects and size of the groups as inputs and the quantity and quality of publications produced by the groups as outputs of the model, the relative efficiencies of 21 research projects are evaluated. Then, we move to focus on the issues of knowledge management of the organizations that undertook these projects and attempt to explore the underlying reasons of high research efficiency. Through integrating the evaluation outcomes into research process, three indicators of knowledge management are identified for the best practice groups with highest research efficiency. The findings verify that the proposed model is valid and practical to assess research performances on the basis of bibliometric indicators.

Keywords: Bibliometric, Bibliometric Indicators, China, Citation Analysis, Data Envelopment Analysis, Dea, Evaluation, Index, Information, Information Science, Interpretation, Japanese, Knowledge, Management, Model, Organization, Outcomes, Practice, Publications, Quality, Quality of Publications, Research, Research Performance, Science, State, Units

? Koenig, M.E.D. and Mezick, E.M. (2004), Impact of mergers & acquisitions on research productivity within the pharmaceutical industry. *Scientometrics*, **59** (1), 157-169.

Full Text: [2004\Scientometrics59, 157.pdf](2004/Scientometrics59,%20157.pdf)

Abstract: Several major econometric studies have looked at mergers and acquisitions (M&As) across various industries and concluded that, in general, there is no synergy created or released by M&A activity. This investigation concentrates upon research and development (R&D) performance in the pharmaceutical industry to examine the impact of M&A activity on corporate productivity. Findings indicate that, when compared to those companies within the pharmaceutical industry that did not experience merger activity during comparable time periods, as well as to the industry as a whole, pharmaceutical companies that merged were able to achieve more favorable post-merger productivity scores than were attained prior to their merger.

Keywords: Development, Impact, Industries, Industry, Pharmaceutical Companies, Productivity, Research, Research and Development, Research Productivity, Technical Change, Too Big

Notes: highly cited

Ho, Y.S. (2004), Citation review of Lagergren kinetic rate equation on adsorption reactions. *Scientometrics*, **59** (1), 171-177.

Full Text: [S\Scientometrics59, 171.pdf](S/Scientometrics59,%20171.pdf)

Abstract: This study presents a literature review concerning the preciseness of over 170 publications citing the original Lagergren’s paper in kinetics equation for solute adsorption on various adsorbents. This equation applies to a range of solid-liquid systems such as metal ions, dyestuffs and several organic substances in aqueous systems onto various adsorbents. The main objectives are to manifest different forms of citations presented and offers a correct reference style for citing the original Lagergren’s paper published in 1898.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous-Solution, Color Removal, Dye Removal, Fly-Ash, Heavy-Metals, Kinetic, Kinetics, Metal, Sorption, Waste-Water, Wastewaters

? Chan, F., Marinova, D. and McAleer, M. (2004), Modelling the asymmetric volatility of anti-pollution patents in the USA. *Scientometrics*, **59** (2), 179-197.

Full Text: [2004\Scientometrics59, 179.pdf](2004/Scientometrics59,%20179.pdf)

Abstract: The paper analyses the asymmetric volatility of patents related to pollution prevention and abatement (hereafter, anti-pollution) technologies registered in the USA. Ecological and pollution prevention technology patents have increased steadily over time, with the 1990’s having been a period of intensive patenting of technologies related to the environment. The time-varying nature of the volatility of anti-pollution technology patents registered in the USA is examined using monthly data from the US Patent and Trademark Office for the period January 1975 to December 1999. Alternative symmetric and asymmetric volatility models, such as GARCH, GJR and EGARCH, are estimated and tested against each other using full sample and rolling windows estimation.

? Chen, C. and Hicks, D. (2004), Tracing knowledge diffusion. *Scientometrics*, **59** (2), 199-211.

Full Text: [2004\Scientometrics59, 199.pdf](2004/Scientometrics59,%20199.pdf)

Abstract: Knowledge diffusion is the adaptation of knowledge in a broad range of scientific and engineering research and development. Tracing knowledge diffusion between science and technology is a challenging issue due to the complexity of identifying emerging patterns in a diverse range of possible processes. In this article, we describe an approach that combines complex network theory, network visualization, and patent citation analysis in order to improve the means for the study of knowledge diffusion. In particular, we analyze patent citations in the field of tissue engineering. We emphasize that this is the beginning of a longer-term endeavor that aims to develop and deploy effective, progressive, and explanatory visualization techniques for us to capture the dynamics of the evolution of patent citation networks. The work has practical implications on resource allocation, strategic planning, and science policy.

? Aksnes, D.W. and Sivertsen, G. (2004), The effect of highly cited papers on national citation indicators. *Scientometrics*, **59** (2), 213-224.

Full Text: [2004\Scientometrics59, 213.pdf](2004/Scientometrics59,%20213.pdf)

Abstract: Citation distributions are extremely skewed. This paper addresses the following question: To what extent are national citation indicators influenced by a small minority of highly cited articles? This question has not been studied before at the level of national indicators. Using the scientific production of Norway as a case, we find that the average citation rates in major subfields are highly determined by one or only a few highly cited papers. Furthermore, there are large annual variations in the influence of highly cited papers on the average citation rate of the subfields. We conclude that an analysis of the underlying data for national indicators may be useful in creating awareness towards the occurrence of particular articles with great influence on what is normally considered an indicator of ‘national performance’, and that the common interpretation of the indicator on research policy level needs to be informed by this fact.

? Egghe, L. (2004), Solution of a problem of Buckland on the influence of obsolescence on scattering. *Scientometrics*, **59** (2), 225-232.

Full Text: [2004\Scientometrics59, 225.pdf](2004/Scientometrics59,%20225.pdf)

Abstract: In an old paper [M.K. Buckland. Are obsolescence and scattering related? Journal of Documentation 28 (3) (1972) 242-246] Buckland poses the question if certain types of obsolescence of scientific literature (in terms of age of citations) implies certain types of journal scattering (in terms of cited journals). This problem is reformulated in terms of one- and two-dimensional obsolescence and linked with one- and two-dimensional growth, the latter being studied by Naranan. Naranan shows that two-dimensional exponential growth (i.e. of the journals and of the articles in journals) implies Lotka’s law, a law belonging to two-dimensional informetrics and describing scattering of literature in a concise way. In this way we obtain that exponential aging of journal citations and of article citations imply Lotka’s law and a relation is given between the exponent U, in Lotka’s law and the aging rates of the two obsolescence processes studied.

Keywords: Aging, Breeds-Success Principle, Citations, Growth, Informetrics, Journal, Journal of Documentation, Journals, Literature, Lotka’s Law, Scientific Literature

? Egghe, L. and Rousseau, R. (2004), How to measure own-group preference? A novel approach to a sociometric problem. *Scientometrics*, **59** (2), 233-252.

Full Text: [2004\Scientometrics59, 233.pdf](2004/Scientometrics59,%20233.pdf)

Abstract: In this article we present a precise definition of the notion “own-group preference” and characterize all functions capable of correctly measuring it. Examples of such functions are provided. The weighted Lorenz curve and the theory developed for it will be our main tools for reaching this goal. We further correct our earlier articles on this subject. In the context of own-language preference, Bookstein and Yitzhaki proposed the logarithm of the odds-ratio as an acceptable measure of own-group preference. We now present a general framework within which the concept of own-group preference, and its opposite, namely own-group aversion, can be precisely pinpointed. This framework is derived form inequality theory and is based on the use of the weighted Lorenz curve. The concept of own-group preference is an interesting notion with applications in different fields such as sociology, political sciences, economics, management science and of course, the information sciences. Some examples are provided.

Keywords: Economics, Information, Journals, Language Self-Citation, Management, Science, Sciences, Sociology, Theory

Debackere, K. and Glänzel, W. (2004), Using a bibliometric approach to support research policy making: The case of the Flemish BOF-key. *Scientometrics*, **59** (2), 253-276.

Full Text: [S\Scientometrics59, 253.pdf](S/Scientometrics59,%20253.pdf)

Abstract: In this paper, we describe the development of a methodology and an instrument to support a major research funding allocation decision by the Flemish government. Over the last decade, and in parallel with the decentralization and the devolution of the Belgian federal policy authority towards the various regions and communities in the country, science and technology policy have become a major component of regional policy making. In the Flemish region, there has been an increasing focus on basing the funding allocation decisions that originate from this policy decentralization on ‘objective, quantifiable and repeatable’ decision parameters. One of the data sources and indicator bases that have received ample attention in this evolution is the use of bibliometric data and indicators. This has now led to the creation of a dedicated research and policy support staff, called ‘Steunpunt O&O Statistieken,’ and the first time application of bibliometric data and methods to support a major inter-university funding allocation decision. In this paper, we analyze this evolution. We show how bibliometric data have for the first time been used to allocate 93 million Euro of public research money between 6 Flemish universities for the fiscal year 2003, based on Web-of-Science SCI data provided to ‘Steunpunt O&O Statistieken’ via a license agreement with Tbomson-ISI. We also discuss the limitations of the current approach that was based on inter-university publication and citation counts. We provide insights into future adaptations that might make it more representative of the total research activity at the universities involved (e.g., by including data for the humanities) and of its visibility (e.g., by including impact measures). Finally, based on our current experience and interactions with the universities involved, we speculate on the future of the specific bibliometric approach that has now been adopted. More specifically, we hypothesize that the allocation method now developed and under further improvement will become more criticized if it turns out that it (1) also starts influencing intra-university research allocation decisions and, as a consequence (2) introduces adverse publication and citation behaviors at the universities involved.

Keywords: Research Performance, Flanders, Science

? Rousseau, R. (2004), Comments on a paper of Garg. *Scientometrics*, **59** (2), 277-278.

Full Text: [2004\Scientometrics59, 277.pdf](2004/Scientometrics59,%20277.pdf)

Keywords: Nations, Scientific Wealth

? Garg, K.C. (2004), Comments on a paper of Garg - Reply. *Scientometrics*, **59** (2), 279.

Full Text: [2004\Scientometrics59, 279.pdf](2004/Scientometrics59,%20279.pdf)

? Glänzel, W. and Thijs, B. (2004), World flash on basic research - the influence of author self-citations on bibliometric macro indicators. *Scientometrics*, **59** (3), 281-310.

Full Text: [2004\Scientometrics59, 281.pdf](2004/Scientometrics59,%20281.pdf)

Abstract: In a recent paper the authors have studied the role of author self-citations within the process of documented scientific communication. Two important regularities such as the relative fast ageing of self-citations with respect to foreign citations and the “square-root law” characterising the conditional expectation of self-citations for given number of foreign citation have been found studying the phenomenon of author self-citations at the macro level. The goal of the present paper is to study the effect of author self-citations on macro indicators. The analysis of citation based indicators for 15 fields in the sciences, social sciences and humanities substantiates that at this level of aggregation there is no need for any revision of national indicators and the underlying journal citation measures in the context of excluding self-citations.

Keywords: Ageing, Basic Research, Bibliometric, Citation, Citations, Communication, Humanities, Indicators, Journal, Patterns, Research, Science Fields, Scientific Communication, Self-Citations, Social Sciences

Lewison, G. (2004), James Bond and citations to his books. *Scientometrics*, **59** (3), 311-320.

Full Text: [2004\Scientometrics59, 311.pdf](2004/Scientometrics59,%20311.pdf)

Abstract: This paper investigates two bibliometric problems: the listing of books in a specialist area (ornithology) and the determination of the citation pattern to individual authors, who often re-issue their books in later editions. James Bond, a Philadelphia ornithologist, who specialised in the birds of the West Indies, is used as an example of a naturalist whose long career led to many journal articles and enduring scientific fame through a well-known book. He also attained some unexpected notoriety through the use of his name by a popular novelist. Methods for the evaluation of his book and associated bird checklists in comparison with other similar works are presented on the basis of their citations.

Keywords: Circulation, Library

? Aleixandre, R., Valderrama, J.C., Desantes, J.M. and Torregrosa, A.J. (2004), Identification of information sources and citation patterns in the field of reciprocating internal combustion engines. *Scientometrics*, **59** (3), 321-336.

Full Text: [2004\Scientometrics59, 321.pdf](2004/Scientometrics59,%20321.pdf)

Abstract: Processes and technology of reciprocating internal combustion engines (ICE) constitute a research field whose characteristics regarding information production and diffusion are determined by multidisciplinarity, the existence of pseudo-technical literature and the influence of confidentiality on the presentation of research outputs. The objective of this study is to provide a quantitative and objective basis for the evaluation of research in this field. This has been accomplished by identifying the most productive journals and the most cited sources, using the SCI and citation analysis. From this analysis, core journals have been identified, showing that their importance in this research area does not correlate with their impact factor. Moreover, conference proceedings (particularly those published by the Society of Automotive Engineers) are shown to be the most important information source in this field.

Keywords: Analysis, Citation, Citation Analysis, Combustion, Communication, Competition, Core Journals, Database, Diffusion, Evaluation, Impact, Impact Factor, Index, Information, Journals, Literature, Publication, Quantitative, Research, Sci, Science, Scientists, Self-Citation

? Shirabe, M. and Tomizawa, H. (2004), Likelihood of inbound/outbound access to co-authorship. *Scientometrics*, **59** (3), 337-344.

Full Text: [2004\Scientometrics59, 337.pdf](2004/Scientometrics59,%20337.pdf)

Abstract: We shall generalize the concept of our previous paper (SHIRABE & TOMIZAWA, 2002), which proposed an index for international scientific co-authorship. Based on a simple model of domestic and international co-authorships, we focused on likelihood of overseas access to co-authorships in the paper. Here, in consideration of bidirectionality of international co-authorship, we shall extend our previous index to two symmetrical indices. The indices can draw a reasonably clear picture of international co-authorship, with regard to difference in patterns of international co-authorship among countries.

Keywords: Co-Authorship, Co-Authorships, Coauthorship, Impact, International Scientific Collaboration, Model, Universities

? Wilson, C.S. and Markusova, V.A. (2004), Changes in the scientific output of Russia from 1980 to 2000, as reflected in the Science Citation Index, in relation to national politico-economic changes. *Scientometrics*, **59** (3), 345-389.

Full Text: [2004\Scientometrics59, 345.pdf](2004/Scientometrics59,%20345.pdf)

Abstract: Three features of the output of scientific papers from Russia which are covered by SCI are reported for the period 1980 to 2000. Changes are related to the major politico-economic developments in the USSR and Russia, and contrasted with similar data from France, Canada and Italy. The problems of isolating Russian papers in the output of the USSR and of estimating the proportion of Russian papers without stated addresses are treated. The Russian annual output grew from 1980 to 1990, but fell by 20-24% after the dissolution of the USSR in late 1991; from 1994 there has been an inconsistent partial recovery, and by 2000 the annual output had approximately regained its 1980 value. The reduced output in the 1990s derives mainly from low government funding for science. The proportion of Russian papers produced in collaboration with other nations has grown from six percent in the early 1980s to 31% in 2000, while the principal regions of collaboration shifted rapidly after 1990 from other republics in the USSR and East Europe to Western Europe and North America. These changes were initiated by glasnost and the end of the Cold War, and more recently have been driven in part by a need for foreign support. Russia’s annual output in the physical sciences in the 1980s was approximately twice, and from 1995 to 2000, approximately four times, that in the life sciences. This continuing dominance, which contrasts with the comparison countries, derives from the high priority given by the central governments to defense spending and related prestige projects.

Keywords: Alive, Canada, Citation, Collaboration, Cooperation, Countries, Discipline, Dissolution, Europe, France, Funding, International Collaboration, Italy, Journals, Life Sciences, Low, Papers, Physics, Recovery, Researchers, Russia, Sci, Science, Science Citation Index, Sciences, Scientific Output, State

? Bar-Ilan, J. (2004), A microscopic link analysis of academic institutions within a country - the case of Israel. *Scientometrics*, **59** (3), 391-403.

Full Text: [2004\Scientometrics59, 391.pdf](2004/Scientometrics59,%20391.pdf)

Abstract: Links analysis proved to be very fruitful on the Web. Google’s very successful ranking algorithm is based on link analysis. There are only a few studies that analyzed links qualitatively, most studies are quantitative. Our purpose was to characterize these links in order to gain a better understanding why links are created. We limited the study to the academic environment, and as a specific case we chose to characterize the interlinkage between the eight Israeli universities.

Keywords: Analysis, Environment, Impact Factors, Information, Interlinking, Pages, Quantitative, Ranking, Universities, University Web Sites

Ingwersen, P. and Jacobs, D. (2004), South African research in selected scientific areas: Status 1981-2000. *Scientometrics*, **59** (3), 405-423.

Full Text: [2004\Scientometrics59, 405.pdf](2004/Scientometrics59,%20405.pdf)

Abstract: The paper is a bibliometric study of the publication and citation patterns and impact of South African research 1981-2000 in five selected research fields: Animal Plant sciences, Chemistry, Biochemistry, Microbiology & molecular biology, including genetics, and Physics, excluding Space science. Data are collected from Science Citation Index via the ISI product National Science Indicators. With the exception of Microbiology & molecular biology and Physics the results demonstrate a decrease of SA publications from 1986-1990. The SA world share declines for all five fields. First from the period 1994-1998 the Animal & plant sciences and Microbiology & molecular biology turn the decline into an increase.

Absolute citation impact is increasing for all the fields from 1989-1993, except for Chemistry. One reason for the increase is a lower publication output. General & internal medicine, as an supplementary volume-heavy field observed, declines in citations until that same period from which it becomes stable, also in impact, but with a marked decrease in cited paper proportion.

In citation world shares the five fields combined show positive signs also since 1989-1993, after which period the international eco-political embargo of SA was lifted. However, Biochemistry and Chemistry continue to decline during the 1990s. Citation impact relative to the world shows a similar pattern, but stagnation appears towards the end of the 1990s in all the observed fields combined. The trends are quite similar to those of Mexico and New Zealand. It is thus highly uncertain if a general citation embargo of SA occurred, yet, in some fields like the Animal & plant sciences, Veterinary science, Chemistry, and General & internal medicine there are signs that a mild citation embargo might have occurred. However, the economic embargo, combined with a significant brain drain, may have had an effect on the publication productivity, after it was lifted. For all indicators Chemistry is undergoing a marked decline during the last decade. This is in line with the negative trends for General & internal medicine, whereas some other medical specialities, biology, economics and other social sciences, the engineering fields and materials sciences keep stable or increase their production. SA is in line with the Mexican development but below that of New Zealand, seemingly losing ground to the developed countries.

Keywords: Science

? Schummer, J. (2004), Multidisciplinarity, interdisciplinarity, and patterns of research collaboration in nanoscience and nanotechnology. *Scientometrics*, **59** (3), 425-465.

Full Text: [2004\Scientometrics59, 425.pdf](2004/Scientometrics59,%20425.pdf)

Abstract: This paper first describes the recent development that scientists and engineers of many disciplines, countries, and institutions increasingly engage in nanoscale research at breathtaking speed. By co-author analysis of over 600 papers published in “nano journals” in 2002 and 2003, I investigate if this apparent concurrence is accompanied by new forms and degrees of multi- and interdisciplinarity as well as of institutional and geographic research collaboration. Based on a new visualization method, patterns of research collaboration are analyzed and compared with those of classical disciplinary research. I argue that current nanoscale research reveals no particular patterns and degrees of interdisciplinarity and that its apparent multidisciplinarity consists of different largely mono-disciplinary fields which are rather unrelated to each other and which hardly share more than the prefix “nano”.

Keywords: Analysis, Collaboration, Development, Field, Indicators, Interdisciplinarity, Multidisciplinarity, Nanoscience, Nanotechnology, Papers, Research, Research Collaboration, Science, Technology, Visualization

? van Raan, A.F.J. (2004), Sleeping Beauties in science. *Scientometrics*, **59** (3), 467-472.

Full Text: [2004\Scientometrics59, 467.pdf](2004/Scientometrics59,%20467.pdf)

Abstract: A ‘Sleeping Beauty in Science’ is a publication that goes unnoticed (‘sleeps’) for a long time and then, almost suddenly, attracts a lot of attention (‘is awakened by a prince’). We here report the -to our knowledge- first extensive measurement of the occurrence of Sleeping Beauties in the science literature. We derived from the measurements an ‘awakening’ probability function and identified the ‘most extreme Sleeping Beauty so far’.

Keywords: Attention, Knowledge, Literature, Measurement, Publication, Science

Snizek, W.E. (2004), A view from sociology. *Scientometrics*, **60** (1), 11-12.

Full Text: [2004\Scientometrics60, 11.pdf](2004/Scientometrics60,%2011.pdf)

McCain, K. (2004), A view from information science. *Scientometrics*, **60** (1), 12-18.

Full Text: [2004\Scientometrics60, 11.pdf](2004/Scientometrics60,%2011.pdf)

? Bonitz, M. (2004), Self-emancipation proclamation and a light-hearted but nevertheless deeply-felt exception. *Scientometrics*, **60** (1), 19-24.

Full Text: [2004\Scientometrics60, 19.pdf](2004/Scientometrics60,%2019.pdf)

? Brown, C. (2004), The Matthew effect of the *Annual Reviews* series and the flow of scientific communication through the World Wide Web. *Scientometrics*, **60** (1), 25-36.

Full Text: [2004\Scientometrics60, 25.pdf](2004/Scientometrics60,%2025.pdf)

Abstract: Authors of the well-regarded Annual Reviews series incorporate URLs to in the text, figures, tables, and reference sections of their articles. Despite the lack of peer review, the number of pointers to scientific information on the World Wide Web in the biomedical and physical science reviews increased five fold between 1997 and 2001. However, only 34% and 76% of the URLs from 1997 and 2001, respectively, remain viable in 2003. This is disconcerting as the stability of the highly cited Annual Reviews series is integral to the flow of scientific information. In fact, the citation rate for the URL containing Annual Reviews articles was found to be less than half that observed for all the review articles analyzed. Taken together these data suggest that the viability of web information may influence the citation rate of authors who have previously basked in the halo of R.K. Merton’s Matt hew Effect.

Keywords: Acceptance, Authors, Biomedical, Citation, Citation Patterns, Communication, Electronic Preprints, Highly-Cited, Information, Matthew Effect, Peer Review, Peer-Review, Review, Science, Scientific Communication, Scientific Information, Stability, Usage, Viability, World Wide Web

? Cole, J.R. (2004), Robert K. Merton, 1910-2003. *Scientometrics*, **60** (1), 37-40.

Full Text: [2004\Scientometrics60, 37.pdf](2004/Scientometrics60,%2037.pdf)

? Cronin, B. (2004), Normative shaping of scientific practice: The magic of Merton. *Scientometrics*, **60** (1), 41-46.

Full Text: [2004\Scientometrics60, 41.pdf](2004/Scientometrics60,%2041.pdf)

Keywords: Citation, Practice

? Fox, M.F. (2004), R.K. Merton - Life time of influence. *Scientometrics*, **60** (1), 47-50.

Full Text: [2004\Scientometrics60, 47.pdf](2004/Scientometrics60,%2047.pdf)

Abstract: In this article, “Life time of influence” refers to Robert K. Merton’s impact broadly, and emblematically, to his influence upon my work. The article discusses 1) the scope and influence of Merton’s ideas about social structure and explanations of social processes; 2) his vast scholarship establishing the study of science as a social institution, with implications for theory and research; and 3) his fostering of the social study of science through immense published work, and through impact upon an inter-generational network of scholars.

Keywords: Impact, Life-Time, Network, Research, Scholarship, Science, Social, Theory

? Garfield, E. (2004), The intended consequences of Robert K. Merton. *Scientometrics*, **60** (1), 51-61.

Full Text: [2004\Scientometrics60, 51.pdf](2004/Scientometrics60,%2051.pdf)

Keywords: Author, Scientometrics

? Hargens, L.L. (2004), What is Mertonian sociology of science? *Scientometrics*, **60** (1), 63-70.

Full Text: [2004\Scientometrics60, 63.pdf](2004/Scientometrics60,%2063.pdf)

Abstract: In order to investigate the nature of Merton’s contribution to the sociology of science, I examine how his work has been cited by groups of authors who are highly co-cited with Merton. The groups differ substantially both in terms of which of Merton’s publications they cite,and how they cite them. This implies that subsequent scholars have found Merton’s sociology of science work valuable for many different reasons. This pattern is probably true for Merton’s sociological oeuvre as a whole, and suggests that scholarly preeminence in the social sciences consists of making contributions that many different groups of scholars judge to be useful in justifying the importance of their own research.

Keywords: Authors, Contribution, Publications, Research, Science, Sciences, Social, Social Sciences, Sociology, Sociology of Science

? Small, H. (2004), On the shoulders of Robert Merton: Towards a normative theory of citation. *Scientometrics*, **60** (1), 71-79.

Full Text: [2004\Scientometrics60, 71.pdf](2004/Scientometrics60,%2071.pdf)

Abstract: In a series of seminal studies Robert K. Merton created a coherent theoretical view of the social system of science that includes the salient features of the formal publication system, thereby providing a theoretical basis for scientometrics and citationology. A fundamental precept of this system is the view of citations as symbolic payment of intellectual debts. When this concept is merged with a complementary theory of the conceptual symbolism of citations, the possibility for a rapprochement of the normative and constructivist theories is achieved, where the dual function of citations as vehicles of peer recognition and constructed symbols for specific original achievements in science is realized. This new synthesis is embodied in a citation classification system,the citation cube, with dimensions of normative compliance, symbolic consensus, and disinterestedness (self-citation).

Keywords: Chapter, Citation, Citations, Compliance, Publication, Science, Scientific Discovery, Scientometrics, Self-Citation, Social, Sociology, Synthesis, Theories, Theory

? Stephan, P.E. (2004), Robert K. Merton’s perspective on priority and the provision of the public good knowledge. *Scientometrics*, **60** (1), 81-87.

Full Text: [2004\Scientometrics60, 81.pdf](2004/Scientometrics60,%2081.pdf)

Abstract: This essay examines Robert K. Merton’s perspective on how priority relates to the provision of the public good knowledge. Economists have long been interested in the provision of the class of goods that are referred to as “public.” By definition, public goods are not used up when consumed and are goods from which it is difficult to exclude potential users. The provision of public goods presents special challenges to the market that do not exist in the provision of private goods. Scientific research has properties of a public good. Merton recognized the public nature of science. In this he was not alone. The genius of Merton is that he not only recognized that science has properties of a public good but stood the public-private distinction on its head, proposing that the reward structure of science, based on priority, functioned to make a public good private. In economic terms, Merton recognized that it is the public nature of knowledge that facilitates establishing the idea as the private property of the scientist.

Keywords: Chapter, Economics, Knowledge, Property, Public Goods, Research, Science, Scientific Discovery, Scientific Research, Sociology

? Stigler, S.M. (2004), Robert K. Merton: Memorial. *Scientometrics*, **60** (1), 89-92.

Full Text: [2004\Scientometrics60, 89.pdf](2004/Scientometrics60,%2089.pdf)

? White, H.D. (2004), Reward, persuasion, and the Sokal Hoax: A study in citation identities. *Scientometrics*, **60** (1), 93-120.

Full Text: [2004\Scientometrics60, 93.pdf](2004/Scientometrics60,%2093.pdf)

Abstract: A citation identity is a list of an author’s citees ranked by how frequently that author has cited them in publications covered by the Institute for Scientific Information. The same Dialog software that creates identities can simultaneously show the overall citation counts of citees, which indicate their reputations. Using identities for 28 authors in several disciplines of science and scholarship, I show that the reputational counts of their citees always have an approximately log-normal distribution:citations to very famous names are roughly balanced by citations to obscure ones, and most citations go to authors of middling reputation. These results undercut claims by constructivists that the main function of citation is to marshal “big-name” support for arguments at the expense of crediting lesser-known figures. The results are better explained by Robert K. Merton’s norm of universalism, which holds that citers are rewarding use of relevant intellectual property, than by the constructivists’ particularism, which holds that citers are trying to persuade through manipulative rhetoric. A universalistic citation pattern appears even in Alan Sokal’s famous hoax article, where some of his citing was deliberately particularistic. In fact, Sokal’s basic adherence to universalism probably helped his hoax succeed, which suggests the strength of the Mertonian norm. In specimen cases, the constructivists themselves are shown as conforming to it.

Keywords: Adherence, Author, Author Cocitation Analysis, Authors, Behavior, Citation, Citation Counts, Citations, Citer Motivations, Facts, Identity, Model, Ortega Hypothesis, Publications, Scholarship, Science, Scientific Information, Software, Strength

? Yu, G., Yu, D. and Li, Y. (2004), The universal expression of periodical average publication delay at steady state. *Scientometrics*, **60** (2), 121-129.

Full Text: [2004\Scientometrics60, 121pdf](2004/Scientometrics60,%20121pdf)

Abstract: The steady state solution of differential equations of periodical publication process is deduced, and based on this, the indicator of periodical publication delay, which reflects the degree of information ageing in editorial board of a periodical, is established. The indicator is proved to be the sum of two items: the pure publication delay, which reflects the editing rapidity of a periodical, and the ratio of deposited contribution quantity to the publishing quantity in one year, which reflects the waiting period of adopted papers deposited in editorial board. As a demonstration, the delay indicators of seven periodicals are calculated. Finally, the application of this indicator is discussed.

Keywords: Ageing, Contribution, Information, Papers, Periodical, Periodicals, Publication, Publishing, Ratio

Collazo-Reyes, F., Luna-Morales, M.E. and Russell, J.M. (2004), Publication and citation patterns of the Mexican contribution to a ‘Big Science’ discipline: Elementary particle physics. *Scientometrics*, **60** (2), 131-143.

Full Text: [2004\Scientometrics60, 131.pdf](2004/Scientometrics60,%20131.pdf)

Abstract: The publication and citation patterns of the Mexican community in elementary particle physics (MEPP) were determined by bibliometric analysis of the scientific production and citations registered in the SPIRES-HEP system from 1971 to 2000. All papers, both citing and cited, were classified as theoretical, phenomenological or experimental according to the type of study carried out and citing papers as local (Mexican) or foreign. The growth dynamics of the citation patterns over the thirty-year period was also studied. Results show that the Mexican scientific community in EPP follow the pre-publication and pre-citation communication patterns typical of a Big Science field.

Keywords: Preprints, Library, Prints

Lewison, G. and Paraje, G. (2004), The classification of biomedical journals by research level. *Scientometrics*, **60** (2), 145-157.

Full Text: [2004\Scientometrics60, 145.pdf](2004/Scientometrics60,%20145.pdf)

Abstract: A new method of classification of biomedical research journals by research level (RL) into clinical or basic, or somewhere in between, is described that updates the system developed by CHI Research Inc. nearly 30 years ago. It is based on counting articles that have one of about 100 ‘clinical’ title words, or one of a similar number of ‘basic’ title words, or both. It allows over 3000 journals in the Science Citation Index (or other databases) to be classified rapidly and transparently, for changes in their research level with time, and for many individual papers in ‘mixed’ journals to be categorised as clinical or basic.

Keywords: Impact

Leydesdorff, L. (2004), Top-down decomposition of the *Journal Citation Report* of the *Social Science Citation Index*: Graph- and factor-analytical approaches. *Scientometrics*, **60** (2), 159-180.

Full Text: [2004\Scientometrics60, 159.pdf](2004/Scientometrics60,%20159.pdf)

Abstract: The aggregated journal-journal citation matrix of the Journal Citation Report 2001 of the Social Science Citation Index is analyzed as a single domain in terms of both its eigenvectors and the bi-connected components contained in it. The traditional disciplines (e.g., economics, psychology, or political science) can be retrieved using both methods. These main disciplines do interact marginally. The space between them is occupied by a large number of small clusters of journals indicating specialties that gravitate among the major disciplines. These specialties operate in a mode different from that of the disciplines. For example, the impact factors are low on average and the developments remain volatile. Factor analysis enables us to study how the smaller bi-connected components are related to the larger ones. Factor analysis also highlights methodological differences among groups which may be theoretically connected in a single bicomponent.

Keywords: Scientific Journals, Indicators, Networks

Trueba, F.J. and Guerrero, H. (2004), A robust formula to credit authors for their publications. *Scientometrics*, **60** (2), 181-204.

Full Text: [2004\Scientometrics60, 181.pdf](2004/Scientometrics60,%20181.pdf)

Abstract: We have developed a formula that assigns relative values to each author of the list of authors in any publication according to the authors’ relative positions. The formula satisfies several criteria of theoretical and practical significance. We tested the formula’s validity and usefulness with bibliographical references from the INSPEC database, mainly from the physical sciences. Enforced alphabetical sorting, different names of single authors and other statistical disturbances are accounted for. Our results demonstrate that our formula, or any other that satisfies several objective and quantitative criteria, can and often should be used as an additional criterion in the processes of evaluating relative scientific productivity, detecting experts in a given discipline, etc.

Keywords: Multiple Authorship, Citation Measures, Productivity, Performance, Counts, Psychology

Hsieh, W.H., Chiu, W.T., Lee, Y.S. and Ho, Y.S. (2004), Bibliometric analysis of patent ductus arteriosus treatments. *Scientometrics*, **60** (2), 205-215.

Full Text: [2004\Scientometrics60, 205.pdf](2004/Scientometrics60,%20205.pdf)

Abstract: A bibliometric analysis was performed to assess the quantitative trend of Patent Ductus Arteriosus (PDA) treatment research, including intravenous injection of indomethacin and surgery. The documents studied were retrieved from the Science Citation Index (SCI) for the period from 1991 to 2002. The publication pattern concerning authorship, collaboration, original countries, citation frequency, document type, language of publication, distribution of journals, page count and the most frequently cited papers were performed. The results indicated that either treatment was not the recent emphasis of PDA research. The publishing countries of both treatments have also denoted that these researches were mostly done in Europe and North America. Both surgery and drug treatments had few international collaboration papers. English was the dominant language, and collaboration of two to six authors was the most popular level of co-authorship.

Keywords: America, Analysis, Authors, Authorship, Bibliometric, Bibliometric Analysis, Citation, Citation Frequency, Citations, Co-Authorship, Coauthorship, Collaboration, Distribution, Drug, Ductus Arteriosus, Europe, Indomethacin, International, Intravenous, Journals, Language, North, Papers, Patent, Patent Ductus Arteriosus, Pattern, Publication, Publications, Publishing, References, Research, SCI, Science, Science Citation Index, Surgery, Treatment, Trend

Sombatsompop, N., Markpin, T. and Premkamolnetr, N. (2004), A modified method for calculating the Impact Factors of journals in ISI Journal Citation Reports: Polymer Science Category in 1997-2001. *Scientometrics*, **60** (2), 217-235.

Full Text: [2004\Scientometrics60, 217.pdf](2004/Scientometrics60,%20217.pdf)

Abstract: his article introduces a new modified method for calculating the impact factor of journals based on the current ISI practice in generating journal impact factor values. The impact factor value for a journal calculated by the proposed method, the so-called Cited Half-Life Impact Factor (CHAL) method, which is based on the ratio of the number of current year citations of articles from the previous X years to that of articles published in the previous X years, the X value being equal to the value of the cited half-life of the journal in the current year. Thirty-four journals in the Polymer Science Category from the ISI Subject Heading Categories were selected and examined. Total citations, impact factors and cited half-life of the 34 journals during the last five years (19972001) were retrieved from the ISI Journal Citation Reports and were used as the data source for the calculations in this work, the impact factor values from ISI and CHAL methods then being compared. The positions of the journals ranked by impact factors obtained from the ISI method were different from those from the CHAL method. It was concluded that the CHAL method was more suitable for calculating the impact factor of the journals than the existing ISI method.

Zhu, X., Wu, Q., Zheng, Y.Z. and Ma, X. (2004), Highly cited research papers and the evaluation of a research university: A case study: Peking University 1974-2003. *Scientometrics*, **60** (2), 237-247.

Full Text: [2004\Scientometrics60, 237.pdf](2004/Scientometrics60,%20237.pdf)

Abstract: The academic level and scientific reputation is the most important merit of a research university. Publication of the scientific achievement in the world leading scientific journals is the key to asses a university’s overall performance. Peking University is a leading university among the Chinese research universities, and the number of papers published in Science Citation Index (SCI) indexed journals has been on the top of the national list.

In this paper, based on our long-term experience and practice in scientific management, we use scientometrics and informetrics method to analyze the academic performance of the researchers, departments and schools of Peking University, mainly using the citations of publications. Highly cited papers are specially important to the reputation of our university. We compare those data with some selected world well-known universities, hence, some important information can be deduced for the policy decision of the university. The results presented here is not only an academic survey, but also a guideline for the future strategic development of Peking University.

Dewett, T. and Denisi, A.S. (2004), Exploring scholarly reputation: It’s more than just productivity. *Scientometrics*, **60** (2), 249-272.

Full Text: [2004\Scientometrics60, 249.pdf](2004/Scientometrics60,%20249.pdf)

Abstract: We explore perceived creativity in scholarship as it relates to scholarly reputation in the field of management. The effects of quantity (total refereed publications, national paper presentations) and quality (proportion of articles in premier journals, editorial activity, research awards) dimensions of scholarly activity are also considered. Our results suggest that the quality dimensions are positively associated with reputation, but that the perceived creativity of a scholar’s work further influences reputation, and partially mediates the relationship between some quality measures and reputation. These results suggest that quality, creativity in particular, is more important than quantity for the accumulation of reputation.

Keywords: Creativity, Performance, Determinants, Recognition, Psychology, Science, Satisfaction, Competition, Innovation, Journals

? Rousseau, R. (2004), Loet Leydesdorff : Recipient of the 2003 Derek de Solla Price Award. *Scientometrics*, **60** (3), 275-277.

Full Text: [2004\Scientometrics60, 275.pdf](2004/Scientometrics60,%20275.pdf)

? Glanzel, W., Jiang, G.H., Rousseau, R. and Wu, Y.S. (2004), Preface. *Scientometrics*, **60** (3), 281-282.

Full Text: [2004\Scientometrics60, 281.pdf](2004/Scientometrics60,%20281.pdf)

Havemann, F., Heinz, M. and Wagner-Döbler, R. (2004), Growth dynamics of German university enrolments and of scientific disciplines in the 19th century: Scaling behaviour under weak competitive pressure. *Scientometrics*, **60** (3), 283-294.

Full Text: [2004\Scientometrics60, 283.pdf](2004/Scientometrics60,%20283.pdf)

Abstract: According to authors like H. E. Stanley and others, growth dynamics of university research displays a quantitative behaviour similar to the growth dynamics of firms acting under competitive pressure. Features of such behaviour are probability distributions of annual growth rates or the standard deviation of growth rates. We show that a similar statistical behaviour can be observed in the growth dynamics of German university enrolments or in the growth dynamics of physics and mathematics, both for the 19th century. Since competitive pressure was generally weak at that time, interpretations of statistical similarities as to pointing to a ‘firm-like behaviour’ are questionable.

? Moed, H.F. and Garfield, E. (2004), In basic science the percentage of ‘authoritative’ references decreases as bibliographies become shorter. *Scientometrics*, **60** (3), 295-303.

Full Text: [2004\Scientometrics60, 295.pdf](2004/Scientometrics60,%20295.pdf)

Abstract: The empirical question addressed in this contribution is: How does the relative frequency at which authors in a research field cite ‘authoritative’ documents in the reference lists in their papers vary with the number of references such papers contain? ‘Authoritative’ documents are defined as those that are among the ten percent most frequently cited items in a research field. It is assumed that authors who write papers with relatively short reference lists are more selective in what they cite than authors who compile long reference lists. Thus, by comparing in a research field the fraction of references of a particular type in short reference lists to that in longer lists, one can obtain an indication of the importance of that type. Our analysis suggests that in basic science fields such as physics or molecular biology the percentage of ‘authoritative’ references decreases as bibliographies become shorter. In other words, when basic scientists are selective in referencing behavior, references to ‘authoritative’ documents are dropped more readily than other types. The implications of this empirical finding for the debate on normative versus constructive citation theories are discussed.

Keywords: Analysis, Authors, Behavior, Biology, Citation, Contribution, Frequency, Indication, Molecular, Molecular Biology, Papers, Research, Science, Theories

Small, H. (2004), Why authors think their papers are highly cited. *Scientometrics*, **60** (3), 305-316.

Full Text: [2004\Scientometrics60, 305.pdf](2004/Scientometrics60,%20305.pdf)

Abstract: A survey of authors of highly cited papers in 22 fields was undertaken in connection with a new bibliometric resource called Essential Science Indicators (ESI®). Authors were asked to give their opinions on why their papers are highly cited. They generally responded by describing specific internal, technical aspects of their work, relating them to external or social factors in their fields of study. These self-perceptions provide clues to the factors that lead to high citation rate, and the importance of the interaction between internal and external factors. Internal factors are revealed by the technical terminology used to describe the work, and how it is situated in the problem domain for the field. External factors are revealed by a different vocabulary describing how the work has been received within the field, or its implications for a wider audience. Each author’s response regarding a highly cited work was analyzed on four dimensions: the author perception of its novelty, utility, significance, and interest. A co-occurrence analysis of the dimensions revealed that interest, the most socially based dimension, was most often paired with one of the other more internal dimensions, suggesting a synergy between internal and external factors.

? Yue, W.P. and Wilson, C.S. (2004), Measuring the citation impact of research journals in clinical neurology: A structural equation modelling analysis. *Scientometrics*, **60** (3), 317-332.

Full Text: [2004\Scientometrics60, 317.pdf](2004/Scientometrics60,%20317.pdf)

Abstract: This study develops and tests an integrated conceptual model of journal evaluation from varying perspectives of citation analysis. The main objective is to obtain a more complete understanding of the external factors affecting journal citation impact; that is, a theoretical construct measured by a number of citation indicators. Structural equation modelling (SEM) with partial least squares (PLS) is used to test the conceptual model with empirical data from journals in clinical neurology. Interrelationships among journal citation impact and four external factors (journal characteristics, journal accessibility, journal visibility and journal internationality) have been successfully explored, and the conceptual model of journal evaluation has been examined.

Keywords: Analysis, Business, Citation, Citation Analysis, Citation Impact, Evaluation, Impact, Index, Journal, Journals, Model, Modelling, Performance, PLS, Research, Science, Scientific Journals, SEM, Visibility

Negishi, M., Sun, Y. and Shigi, K. (2004), Citation database for Japanese papers: A new bibliometric tool for Japanese academic society. *Scientometrics*, **60** (3), 333-351.

Full Text: [2004\Scientometrics60, 333.pdf](2004/Scientometrics60,%20333.pdf)

Abstract: The paper describes the construction and functions of the Citation Database for Japanese Papers (CJP) developed at the National Institute of Informatics, Japan (NII), and the Impact Factors of CJP’s source journals. Then statistical analyses of multidimensional scaling on citation counts for the academic society journals to measure relationship among the societies are described. We also introduce a new citation navigation system, CiNii, which enables users to access various resources provided by NIL such as NACSIS Electronic Library Service (NACSIS-ELS) to get electronic full-text of journal articles through citation links. Recent political developments in Japan towards enhancement of scientific information infrastructure are also introduced with its implication to research evaluation systems incorporating citation analyses.

Keywords: Index

Shelton, R.D. and Holdridge G.M. (2004), The US-EU race for leadership of science and technology: Qualitative and quantitative indicators. *Scientometrics*, **60** (3), 353-363.

Full Text: [2004\Scientometrics60, 353.pdf](2004/Scientometrics60,%20353.pdf)

Abstract: Both the United States and the European Union have set goals for worldwide leadership of science and technology. While the U. S. leads in most input quantitative indicators, output indicators may be more specific for determining present leadership. They show that the EU has taken the lead in important metrics and is challenging the U. S. in others. Qualitative indicators of fields of research and development, based on expert review studies organized by the authors, confirm that many EU labs are equal or better than those in the U. S.

Markusova, V.A., Minin, V.A., Libkind, A.N., Jansz, C.N.M., Zitt, M. and Bassecoulard-Zitt, E. (2004), Research in non-metropolitan universities as a new stage of science development in Russia. *Scientometrics*, **60** (3), 365-383.

Full Text: [2004\Scientometrics60, 365.pdf](2004/Scientometrics60,%20365.pdf)

Abstract: The tremendous social and political changes that culminated in the Soviet Union’s dissolution had a great impact on the Russian science community. Due to the Russian transformation to a market economy a new model of R&D emerged on the basis of the higher education system (R&D in universities). This paper is part of a project, the main goals of which were to analyse the impact of competitive funding on R&D in provincial universities, the distribution of funding by the Russian Foundation for Basic Research, and the level of cross-sectoral and international collaboration. This paper gives a descriptive overview of R&D conducted at the 380 provincial universities, looking at 9,800 applications, 1,950 research projects, 19, 981 individuals, and more than 29,600 publications for the period 1996-2001. Our data demonstrated a positive tendency in demographic statistics in the provinces. A map of intra-national collaboration taking place in 1995 2002 in provincial universities situated in different economic regions was designed. Our data show a strong collaboration within the regions, which is an important factor of sustainability. Publication output grew by a factor two or two-and half in six years. The share in output on mathematics was the highest at about 45%, physics and chemistry had equal shares of about 20% each. Researchers from the Ural and Povolzh’e regions were more active in knowledge dissemination than their colleagues from the other nine economic-geographic regions. Bibliometric analysis of more than 1, 450 international collaborative publications for 1999 2001 demonstrated a strong shift in collaboration partners from Former East Block and former USSR countries to Western Europe, USA and Japan. Among the regions, Povolzh’e, Ural, Volgo-Vyatsky and Central Chemozem’e demonstrated a stronger tendency to collaborate. This collaboration depends heavily on financial support from foreign countries.

? Wu, Y.S., Pan, Y.T., Zhang, Y.H., Ma, Z., Pang, J.G., Guo, H., Xu, B. and Yang, Z.Q. (2004), China Scientific and Technical Papers and Citations (CSTPC): History, impact and outlook. *Scientometrics*, **60** (3), 385-397.

Full Text: [2004\Scientometrics60, 385.pdf](2004/Scientometrics60,%20385.pdf)

Abstract: This paper traces the history of China Scientific and Technical Papers and Citations database (CSTPC) since its founding in 1988. The fact that most Chinese scientists publish their research results in Chinese journals requires that China establish SCI counterparts dedicated to domestic S & T journals. The article describes the selection criteria for source journals, the approach used to adjust the structure of source journals, the criteria for selecting items to be included in the database, and the indexing method. Then it discusses the impact upon government R & D administration agencies and the science community in general by both CSTPC team and CSTPC database. Finally, the article analyzes the main factors that lead to the primary success of CSTPD. The authors encourages information workers in other non-English developing countries to build up similar databases.

Keywords: Authors, China, Chinese Journals, Citations, Databases, Developing Countries, History, Impact, Indexing, Information, Journals, Lead, Primary, Research, SCI, Science, Success

? Beaver, D.D. (2004), Does collaborative research have greater epistemic authority? *Scientometrics*, **60** (3), 399-408.

Full Text: [2004\Scientometrics60, 399.pdf](2004/Scientometrics60,%20399.pdf)

Abstract: This paper presents qualitative philosophical, sociological, and historical arguments in favor of collaborative research having greater epistemic authority than research performed by individual scientists alone. Quantitatively, epistemic authority is predicted to correlate with citations, both in number, probability of citation, and length of citation history. Data from a preliminary longitudinal study of 33 researchers supports the predicted effects, and, despite the fallacy of asserting the consequent, is taken to confirm the hypothesis that collaborative research does in fact have greater epistemic authority.

Keywords: Citation, Citations, History, Longitudinal Study, Research, Researchers

? Kretschmer, H. (2004), Author productivity and geodesic distance in bibliographic co-authorship networks, and visibility on the Web. *Scientometrics*, **60** (3), 409-420.

Full Text: [2004\Scientometrics60, 409.pdf](2004/Scientometrics60,%20409.pdf)

Abstract: The increasing cooperation in science, which has led to larger co-authorship networks, requires the application of new methods of analysis of social networks in bibliographic co-authorship networks as well as in networks visible on the Web. In this context, a number of interesting papers on the “Erdos Number”, which gives the shortest path (geodesic distance) between an author and the well-known Hungarian mathematician Erdos in a co-authorship network, have been published recently. This paper develops new methods concerning the position of highly productive authors in the network. Thus a relationship of distribution of these authors among the clusters in the co-authorship network could be proved to be dependent upon the size of the clusters. Highly productive authors have, on average, low geodesic distances and thus shorter length of paths to all the other authors of a specialism compared to low productive authors, whereas the influencing possibility of highly productive scientists gets distributed amongst others in the development of the specialism. A theory on the stratification in science with respect to the over random similarity of scientists collaborating with one another, previously covered with other empirical methods, could also be confirmed by the application of geodesic distances. The paper proposes that the newly developed methodology may also be applied to visible networks in future studies on the Web. Further investigation is warranted into whether co-authorship and web networks have similar structures with regards to author productivity and geodesic distances.

Keywords: Analysis, Author, Authors, Bibliographic, Co-Authorship, Co-Authorship Networks, Coauthorship, Cooperation, Development, Low, Methodology, Network, Papers, Patterns, Productivity, Science, Social, Social Networks, Theory, Visibility

Persson, O., Glänzel, W. and Danell, R. (2004), Inflationary bibliometric values: The role of scientific collaboration and the need for relative indicators in evaluative studies. *Scientometrics*, **60** (3), 421-432.

Full Text: [2004\Scientometrics60, 421.pdf](2004/Scientometrics60,%20421.pdf)

Abstract: Several research studies and reports on national and European science and technology indicators have recently presented figures reflecting intensifying scientific collaboration and increasing citation impact in practically all science areas and at all levels of aggregation. The main objective of this paper is twofold, namely first to analyse if the number or weight of actors in scientific communication has increased, if patterns of documented scientific communication and collaboration have changed in the last two decades and if these tendencies have inflationary features. The second question is concerned with the role of scientific collaboration in this context. In particular, the question will be answered to what extent co-authorship and publication activity, on one hand, and co-authorship and citation impact, on the other hand, do interact.

The answers found to these questions have strong implication for the application of bibliometric indicators in research evaluation, moreover, the construction of indicators applied to trend analyses and studies based on medium-term or long-term observations have to be reconsidered to guarantee the validity of conclusions drawn from bibliometric results.

Keywords: Co-Authorship, Patterns

? Yoshikane, F. and Kageura, K. (2004), Comparative analysis of coauthorship networks of different domains: The growth and change of networks. *Scientometrics*, **60** (3), 433-444.

Full Text: [2004\Scientometrics60, 433.pdf](2004/Scientometrics60,%20433.pdf)

Abstract: Many studies have tried to describe patterns of research collaboration through observing coauthorship networks. Those studies mainly analyze static networks, and most of them do not consider the development of networks. hi this study, we turn our attention to the development of personal collaboration networks. On the basis of an analysis from two viewpoints, i.e., growth in the number of collaborating partners and change in the relationship strength with partners, we describe and compare the characteristics of four different domains, i.e., electrical engineering, information processing, polymer science, and biochemistry.

Keywords: Analysis, Attention, Authorship Patterns, Coauthorship, Collaboration, Countries, Development, Growth, Information, Information Processing, International Collaboration, Journals, Multiple Authorship, Polymer, Research, Research Collaboration, Science, Scientific Collaboration, Strength

? Lamirel, J.C., Francois, C., AL Shehabi, S. and Hoffmann, M. (2004), New classification quality estimators for analysis of documentary information: Application to patent analysis and web mapping. *Scientometrics*, **60** (3), 445-462.

Full Text: [2004\Scientometrics60, 445.pdf](2004/Scientometrics60,%20445.pdf)

Abstract: The information analysis process includes a cluster analysis or classification step associated with an expert validation of the results. In this paper, we propose new measures of Recall/Precision for estimating the quality of cluster analysis. These measures derive both from the Galois lattice theory and from the Information Retrieval (IR) domain. As opposed to classical measures of inertia, they present the main advantages to be both independent of the classification method and of the difference between the intrinsic dimension of the data and those of the clusters. We present two experiments on the basis of the MultiSOM model, which is an extension of Kohonen’s SOM model, as a cluster analysis method. Our first experiment on patent data shows how our measures can be used to compare viewpoint-oriented classification methods, such as MultiSOM, with global cluster analysis method, such as WebSOM Our second experiment, which takes part in the EICSTES EEC project, is an original Webometrics experiment that combines content and links classification starting from a large non-homogeneous set of web pages. This experiment highlights the fact that break-even points between our different measures of Recall/Precision can be used to determine an optimal number of clusters for web data classification. The content of the clusters obtained when using different break-even points are compared for determining the quality of the resulting maps.

Keywords: Analysis, Application, Information, Ir, Mapping, Model, Patent, Points, Quality, Self-Organizing-Maps, Theory, Validation, Webometrics

? Qiu, J.P., Chen, J.Q. and Wang, Z. (2004), An analysis of backlink counts and Web Impact Factors for Chinese university websites. *Scientometrics*, **60** (3), 463-473.

Full Text: [2004\Scientometrics60, 463.pdf](2004/Scientometrics60,%20463.pdf)

Abstract: This article aims to study the total backlink counts, external backlink counts and the Web Impact Factors (WIFs) for Chinese university websites. By studying whether the backlink counts and WIFs of websites associate with the comprehensive ratings and the research ratings for Chinese universities, the article demonstrates that the external backlink count can be a better evaluation measure for university websites than WIF. The study also investigated issues about data collection by using different search engines. It shows that data collected by Alta Vista are more stable than AllTheWeb.

Keywords: Analysis, Data Collection, Evaluation, Factors, Impact, Information, Research, Universities, University, Websites

Tang, R. and Thelwall, M. (2004), Patterns of national and international Web inlinks to US academic departments: An analysis of disciplinary variations. *Scientometrics*, **60** (3), 475-485.

Full Text: [2004\Scientometrics60, 475.pdf](2004/Scientometrics60,%20475.pdf)

Abstract: An investigation of links to 89 US academic departments from three different disciplines gave insights into the kinds of international regions and national domains that linked to them. While significant correlations were found between total counts of international inlinks and total publication impact in Psychology and Chemistry, counts of international inlinks to History departments were too small to give a significant result. The correlations suggest that international links may reflect, to a certain extent, patterns of scholarly communication. Even though History departments attracted a significantly lower percentage of international inlinks than those of Chemistry and Psychology, the main source of links for all three disciplines was from Europe. Analyses of national inlinks, characterized by gTLDs (generic Top Level Domains), showed that the major source of links for all disciplines was .edu sites, followed by .com, .org, .net. As a whole, international regional differences in disciplines were stronger than gTLD differences, although in both cases discrepancies were not of a large scale.

Keywords: Impact Factors, Site Interlinking, Critical-View, Links, Communication, Bibliometrics, Webometrics, Science

? Vaughan, L.W. and Wu, G.Z. (2004), Links to commercial websites as a source of business information. *Scientometrics*, **60** (3), 487-496.

Full Text: [2004\Scientometrics60, 487.pdf](2004/Scientometrics60,%20487.pdf)

Abstract: Websites of China’s top 100 information technology (IT) companies were examined. Link count to a company’s website was found to correlate with the company’s revenue, profit, and research and development expenses. This suggests that Web hyperlinks to commercial sites can be a business performance indicator and thus a source of business information. This information is useful for Web business intelligence and Web data mining. As a comparison to IT companies, China’s top 100 privately owned companies were also studied. No relationship between link count and the business performance measure was found for these companies due probably to the heterogeneous nature of this group. Data collection issues for webometrics research were also explored in the study.

Keywords: Data Mining, Development, Information, Information Technology, Performance Measure, Research, Research And Development, Sites, Web Impact Factors, Webometrics, Websites

? Egghe, L. (2004), Positive reinforcement and 3-dimensional informetrics. *Scientometrics*, **60** (3), 497-509.

Full Text: [2004\Scientometrics60, 497.pdf](2004/Scientometrics60,%20497.pdf)

Abstract: We show that the composition of two information production processes (IPPs), where the items of the first IPP are the sources of the second, and where the ranks of the sources in the first IPP agree with the ranks of the sources in the second IPP, yields an IPP which is positively reinforced with respect to the first IPP. This means that the rank-frequency distribution of the composition is the composition of the rank-frequency distribution of the first IPP and an increasing function phi, which is explicitly calculable from the two IPPs’ distributions. From the rank-frequency distribution of the composition, we derive its size-frequency distribution in terms of the size-frequency distribution of the first IPP and of the function phi. The paper also relates the concentration of the reinforced IPP to that of the original one. This theory solves part of the problem of the determination of a third IPP from two given ones (so-called three-dimensional informetrics). In this paper we solved the “linear” case, i.e., where the third IPP is the composition of the other two IPPs.

Keywords: Information, Informetrics, Laws, Productivity, Systems, Theory

? Glanzel, W. (2004), Towards a model for diachronous and synchronous citation analyses. *Scientometrics*, **60** (3), 511-522.

Full Text: [2004\Scientometrics60, 511.pdf](2004/Scientometrics60,%20511.pdf)

Abstract: This paper gives an overview of the diachronous (prospective) and synchronous (retrospective) approach to ageing studies of scientific literature from the perspective of technical reliability, visualising the different aspects that can be analysed by the two approaches. The main objective is to deepen the understanding of the mechanism and the theory underlying the two aproaches, and is to show that the difference between the diachronous and synchronous model is not “Just counting into opposite directions”. In this context, a stochastic model is presented showing that one and the same model can be used to describe both diachronous and synchronous perspectives of citation processes. On the basis of this model, it is explained how some diachronous and synchronous citation-based indicators can be re-calculated for changing publication periods and citation windows underlying their construction. The paper is concluded by several applications such as the definition and calculation of diachronous (prospective) and synchronous (retrospective) journal impact measures and other citation indicators used in research evaluation.

Keywords: Age Data, Ageing, Citation, Evaluation, Growth, Impact, Journal, Journal Impact, Literature, Mechanism, Model, Obsolescence, Overview, Publication, Reliability, Research, Research Evaluation, Scientific Literature, Social-Sciences, Theory

? Shan, S., Jiang, G.H. and Jiang, L. (2004), The multivariate Waring distribution and its application. *Scientometrics*, **60** (3), 523-535.

Full Text: [2004\Scientometrics60, 523.pdf](2004/Scientometrics60,%20523.pdf)

Abstract: The multivariate Waring distribution is developed and investigated. A special case, the bivariate Waring distribution, is considered. It is shown that the distributions have some nice properties as multivariate distribution. Some applications to the distribution of scientific productivity are discussed.

Keywords: Productivity, Scientific Productivity

Liang, L.M., Liu, J.W. and Rousseau, R. (2004), Name order patterns of graduate candidates and supervisors in Chinese publications: A case study of three major Chinese universities. *Scientometrics*, **61** (1), 3-18.

Full Text: [S\Scientometrics61, 3.pdf](S/Scientometrics61,%203.pdf)

Abstract: Studying three Chinese major universities of different type, this article attempts to validate earlier results related to authors’ name order in papers co-authored by graduate candidates and their supervisors. Candidates for the doctoral degree as well as the master’s degree are considered. Defining the g-ratio as the fraction of co-authored publications where the graduate student’s name precedes that of the supervisor’s we obtain the following results. 1) Generally, master’s level g-ratios are smaller than the corresponding doctoral level g-ratios. 2) The three doctoral g-ratio time series have a common characteristic: they tend to a limiting target value of somewhat more than 80%. The master’s time series of the three universities extend themselves in parallel with the doctoral time series. 3) The g-ratio of collaborative papers related to the dissertation is higher than the g-ratio of collaborative papers not related to the dissertation. This is true on the doctoral level as well as on the master’s level. 4) Different disciplines have different g-ratios, representing disciplinary customs in graduate candidate-supervisor collaboration, the highest g-ratio in the doctoral case occurring in biology (except for Tsinghua University that does not offer courses in biology). 5) There exist only small differences between the g-ratios of different kinds of universities. 6) In recent years, the same candidate-supervisor collaboration patterns exist in international publications as in domestic ones. The fact that the doctoral g-ratios of all three universities are as high as 80% reflects a universal regularity in the structure of scientific collaboration between doctoral candidates and their supervisors in China.

Keywords: Scientific Productivity, Authors, Citation, Age, Collaboration, Science

? Bornmann, L. and Enders, J. (2004), Social origin and gender of doctoral degree holders - Impact of particularistic attributes in access to and in later career attainment after achieving the doctoral degree in Germany. *Scientometrics*, **61** (1), 19-41.

Full Text: [2004\Scientometrics61, 19.pdf](2004/Scientometrics61,%2019.pdf)

Abstract: Within the scope of this article we went further into the question to what extent particularistic attributes - social origin and gender - can affect selection processes (1) in access to and (2) in later career attainment after achieving the doctoral degree. The analyses are based on a questionnaire survey (n = 2 244) among doctoral degree holders achieving the doctoral degree in six selected disciplines (biology, electrical engineering, German studies, mathematics, social sciences, and business studies/economics) at German universities. In terms of our first object of investigation, the analyses show that in four out of six disciplines doctoral degree holders are a selected group compared to university graduates with regard to both social origin and gender. In terms of our second object of investigation - the impact of particularistic attributes on several indicators of further career attainment after achieving the doctoral degree (career inside or outside higher education and science, career position and income) - the results point to a stronger impact of gender compared to social origin.

Keywords: Association, Biology, Cross Classifications, Education, Gender, Germany, Higher Education, Impact, Income, Men, Questionnaire, Questionnaire Survey, Science, Sciences, Social, Social Sciences, Survey, Tests, Universalism, Universities, University, Women

? Kim, M.S. and Park, Y.T. (2004), The evolving patterns of inter-industrial knowledge structure: Case of Korean manufacturing in the 1980s. *Scientometrics*, **61** (1), 43-54.

Full Text: [2004\Scientometrics61, 43.pdf](2004/Scientometrics61,%2043.pdf)

Abstract: The notion of knowledge-based economy premises that technological knowledge be created, accumulated and disseminated through the interactive learning among principal actors in the national system. This paper analyzes, from a dynamic perspective, the structure of inter-industrial technological knowledge. Both human-driven disembodied channel and capital-driven embodied channel are investigated based on network analysis. The set of empirical data covers the Korean manufacturing sector during the 1980s. Overall, density of network tends to be increasing over time, implying that knowledge network becomes expanded and intensified. A number of distinctive features are identified between knowledge types and industrial categories. The findings in turn render important policy implications that should be addressed when developing technology policy. Clearly, the policy framework needs to be industry-specific and country-specific in accordance with the development stage and industrial structure of reference time.

Keywords: Analysis, Development, Knowledge, Learning, Network, Policy, Systems, Taxonomy

? Upadhye, R.P., Kalyane, V.L., Kumar, V. and Prakasan, E.R. (2004), Scientometric analysis of synchronous references in the Physics Nobel lectures, 1981-1985: A pilot study. *Scientometrics*, **61** (1), 55-68.

Full Text: [2004\Scientometrics61, 55.pdf](2004/Scientometrics61,%2055.pdf)

Abstract: Scientometric analysis of synchronous references in the nine Physics Nobel lectures by Nicolaas Bloembergen (1981), Arthur L. Schawlow (1981), Kai M. Siegbalm (1981), Kenneth G. Wilson (1982), Subrahmanyan Chandrasekhar (1983), William A. Fowler (1983), Carlo Rubbia (1984), Simon van der Meer (1984), and Klaus von Klitzing (1985) indicated high variations: No. of Synchronous References ranged from 24 (Meer) to 283 (Siegbahn); Synchronous Self-References ranged from 5 (Rubbia) to 88 (Siegbahn); synchronous references to others ranged from 10 (Chandrasekhar) to 255 (Wilson); Synchronous Self-Reference Rates ranged from 6.66% (Rubbia) to 65.51% (Chandrasekhar); Single-Authored References ranged from 15 (Klitzing) to 160 (Wilson); Multi-Authored References ranged from 4 (Chandrasekhar) to 194 (Siegbahn); Collaboration Coefficient in the synchronous references ranged from 0.14 (Chandrasekhar) to 0.75 (Klitzing); and Recency (age of 50% of the latest references) ranged from 2 (Klitzing) to 18 (Chandrasekhar) years. Seventy five per cent of the references belonged to journal articles. Highly referred journals were Astrophysical Journal, Physical Review B, Physical Review Letters, Arkiv, Fuer, Fysik, Surface Science, Physics Letters, and IEEE Transactions on Nuclear Science.

Keywords: Analysis, Collaboration, Indicators, Journal, Journals, Physics, References, Review, Science, Self-Citations

Chiu, W.T., Huang, J.S. andHo, Y.S. (2004), Bibliometric analysis of severe acute respiratory syndrome-related research in the beginning stage. *Scientometrics*, **61** (1), 69-77.

Full Text: [S\Scientometrics61, 69.pdf](S/Scientometrics61,%2069.pdf)

Abstract: Severe Acute Respiratory Syndrome (SARS) has become the major of health issues since its outbreak early 2003. No analyses by bibliometric technique that have examined this topic exist in the literature. The objective of this study is to conduct a bibliometric analysis of all SARS-related publications in Science Citation Index (SCI) in the early stage. A systematic search was performed using the SCI for publications since SARS outbreak early 2003. Selected documents included ‘severe acute respiratory syndrome’ or ‘SARS’ as a part of its title, abstract, or keyword from the beginning stage of SARS outbreak, March till July 8, 2003. Analysis parameters included authorship, patterns of international collaboration, journals, language, document type, research institutional address, times cited, and reprint address. Citation analysis was mainly based on impact factor as defined by Journal Citation Reports (JCR) issued in 2002 and on the actual citation impact (ACI), which has been used to assess the impact relative to the whole field and has been defined as the ratio between individual citation per publication value and the total citation per publication value. Thirty-two percent of total share was published as news features, 25% as editorial materials, 22% as articles, 13% as letters, and the remaining being biographic items, corrections, meeting abstracts, and reprints. The US dominated the production by 30% of the total share followed closely by Hong Kong with 24%. Sixty-three percent of publication was published by the mainstream countries. The SARS publication pattern in the past few months suggests immediate citation, low collaboration rate, and English and mainstream country domination in production. We observed no associations of research indexes with the number of cases.

Keywords: Abstracts, Analyses, Analysis, Articles, Authorship, Bibliometric, Bibliometric Analysis, Cases, Citation, Citation Analysis, Citation Impact, Collaboration, Country, Domination, Field, Health, Hong Kong, Impact, Impact Factor, Indexes, Institutional, Institutional Address, International, Journal Citation Reports, Journals, Language, Literature, Meeting, Meeting Abstracts, News, Objective, Pattern, Production, Publication, Publications, Research, SAR, SARS, SCI, Science, Science Citation Index, Search, Severe Acute Respiratory Syndrome, Syndrome, Systematic, Technique, Till, US, Value

Mehrdad, M., Heydari, A., Sarbolouki, M.N. and Etemad, S. (2004), Basic science in the Islamic Republic of Iran. *Scientometrics*, **61** (1), 79-88.

Full Text: [S\Scientometrics61, 79.pdf](S/Scientometrics61,%2079.pdf)

Abstract: The population of Iran has nearly doubled in less than 25 years, while the number of university students has increased more than 10 times and 720 Ph. D. degrees have been awarded in basic science in the past 10 years. Despite the great difficulties that the Iranian scientists have been facing for more than two decades (as a consequence of a social revolution, 8 years of a destructive war imposed by Iraq, excessive brain drain, discriminatory practices by some international journals in publishing the Iranian articles, and unfair sanctions imposed by the industrialized countries) Iran’s science is still thriving and the current number of yearly scientific publications exceeds 1500. When normalized with respect to the number of researchers and the research budget, the Iranian scientists seem to outperform most of their counterparts in the advanced industrialized nations. Main reason: total engagement in truncated research activities (basic or applied) leading solely to pure publications, lack of infrastructure for developmental research activities leading to new technologies. The average impact factor of the papers in various fields of basic science seems quite satisfactory considering the difficult conditions the Iranian scientists are working under. Should the research budgets and conditions improve and the unfair sanctions currently imposed by the world politics be eliminated, a far better contribution to the world science can be expected.

Alfaraz, P.H. and Calvino, A.M. (2004), Bibliometric study on food science and technology: Scientific production in Iberian-American countries (1991-2000). *Scientometrics*, **61** (1), 89-102.

Full Text: [S\Scientometrics61, 89.pdf](S/Scientometrics61,%2089.pdf)

Abstract: This study presents a bibliometric analysis of the scientific production in the food science and technology (EST) field for the period 1991-2000, in Iberian-America (IA). Eight selected IA countries contributed 97.6% of the IA production and accounted for a 6.6% of the world production. The most frequent document type is journal article published in English. Retrieved records display characteristical authorship patterns and preferred subject areas. Spain, Brazil, Mexico, Argentina and Portugal determine the IA pattern of sources of publication. The fifty top ranked journals, 80% of which were indexed by the SCIE, encompass two-thirds of the IA production.

Keywords: Impact, Indicators, Output, Index

? Egghe, L. (2004), The source-item coverage of the Lotka function. *Scientometrics*, **61** (1), 103-115.

Full Text: [2004\Scientometrics61, 103.pdf](2004/Scientometrics61,%20103.pdf)

Abstract: The following problem has never been studied : Given A, the total number of items (e.g. articles) and T, the total number of sources (e.g. journals that contain these articles) (hence A>T), when is there a Lotka function f(j) = D/j(alpha) that represents this situation (i.e. where to) denotes the density of the sources in the item-density j)? And, if it exists, what are the formulae for D and alpha? This problem is solved in both cases with j is an element of [1, rho]: where (a) rho = infinity and where (b) rho < &INFIN;. Note that p = the maximum density of the items. If &rho; = &INFIN;, then A and T determine uniquely D and &alpha;. If &rho; < infinity, then we have, for every alpha less than or equal to 2, a solution for D and rho, hence for f. If rho < &INFIN; and &alpha; > 2 then we show that a solution exists if and only if mu = A/T < &alpha;-1/&alpha;-2. This sheds some light on the source-item coverage power of Lotka’s law.

Keywords: Coverage, Journals, Lotka’s Law, Power

Wray, K.B. (2004), An examination of the contributions of young scientists in new fields. *Scientometrics*, **61** (1), 117-128.

Full Text: [S\Scientometrics61, 117.pdf](S/Scientometrics61,%20117.pdf)

Abstract: I examine whether or not new scientific specialties present young scientists with better opportunities to make significant discoveries than established specialties by examining a series of significant discoveries in the first 22 years of the field of bacteriology. I found that it was middle aged scientists, not young scientists, who were responsible for a disproportionate number of significant discoveries. I argue that in order to make significant discoveries scientists need to work their way into the center of the social network of a scientific research community. Only then will they have access to the material and social resources necessary to make such discoveries.

Keywords: Creative Productivity, Age, Achievement, Acceptance, Science, Model

? Moya-Anegon, F., Vargas-Quesada, B., Herrero-Solana, V., Chinchilla-Rodriguez, Z., Corera-Alvarez, E. and Munoz-Fernandez, F.J. (2004), A new technique for building maps of large scientific domains based on the cocitation of classes and categories. *Scientometrics*, **61** (1), 129-145.

Full Text: [2004\Scientometrics61, 129.pdf](2004/Scientometrics61,%20129.pdf)

Abstract: Our objective is the generation of schematic visualizations as interfaces for scientific domain analysis. We propose a new technique that uses thematic classification (classes and categories) as entities of cocitation and units of measure, and demonstrate the viability of this methodology through the representation and analysis of a domain of great dimensions. The main features of the maps obtained are discussed, and proposals are made for future improvements and applications.

Keywords: Analysis, Citation Analysis, Cocitation, Digital Libraries, Domain Analysis, Information-Science, Interfaces, Knowledge Domains, Literatures, Methodology, Pathfinder Networks, Viability, Visualization, Word Analysis

? Ahmed, T., Johnson, B., Oppenheim, C. and Peck, C. (2004), Highly cited old papers and the reasons why they continue to be cited. Part II. The 1953 Watson and Crick article on the structure of DNA. *Scientometrics*, **61** (2), 147-156.

Full Text: [S\Scientometrics61, 147.pdf](S/Scientometrics61,%20147.pdf)

Abstract: Reports the results of a citation study on Watson and Crick’s 1953 paper announcing the discovery of the double helix structure of DNA. The paper has been cited more than 2,000 times since 196 1, and there is no sign of any obsolescence to this article. An analysis was undertaken of the journals in which the citations appeared, and of mistakes in the bibliographic citations provided by citing articles. Watson and Crick themselves have only cited their own paper twice since 1961. An analysis was also undertaken of the reasons why the paper was cited, 100 citing articles were identified and read. The reasons for citing were then categorised using the Oppenheim and Renn method. Compared to earlier studies, it was found that a greater proportion of citations were for historical reasons, a smaller proportion of citing articles were actively using the Watson and Crick article, and a similar, but low proportion were criticising the Watson and Crick article.

Keywords: Citation Behavior, Library, Motivations, Research Assessment Exercise

? Rai, L.P. and Kumar, N. (2004), S&T education in India: Prospects and challenges. *Scientometrics*, **61** (2), 157-169.

Full Text: [2004\Scientometrics61, 157.pdf](2004/Scientometrics61,%20157.pdf)

Abstract: With the globalisation of the job market, higher education is undergoing structural changes and education scenario worldwide is experiencing dramatic and accelerating changes in patterns of creation of new knowledge. Similar activities are being witnessed in India as regards to the production of highly qualified S&T personnel in different disciplines. In this paper a comparative analysis of doctorates produced in India during 1974 to 1999 in different fields is carried out with the help of mathematical models. Besides analysing the trends of highly qualified S&T personnel with the help of known mathematical models, a few new substitution models have been proposed and applied to explain the movement of researchers from one discipline to the other. Findings suggest that arts, commerce, education and medicine depict growing trends, whereas agriculture, science and veterinary science are traversing a declining path. Further, proposed models are found to be flexible in nature and can capture and explain the shifting patterns very well. These models are comparable to other known models dealing with technology substitution.

Keywords: Activities, Analysis, Diffusion, Education, Globalisation, Higher Education, India, Knowledge, Medicine, Models, Movement, Researchers, Science, Substitution, Trends

Gu, Y.N. (2004), Global knowledge management research: A bibliometric analysis. *Scientometrics*, **61** (2), 171-190.

Full Text: [S\Scientometrics61, 171.pdf](S/Scientometrics61,%20171.pdf)

Abstract: The present study characterizes the dynamic publication activity of global knowledge management (KM) by data collected through a search restricted to articles in ISI Web of Science. A total of 2727 unique authors had contributed 1407 publications since 1975. The overwhelming majority (2349 or 86%) of them wrote one publication. The productive authors, their contribution and authorship position are listed to indicate their productivity and degree of involvement in their research publications. The sum of research output of the first or responsible authors from USA, UK and Germany reaches 57% of the total productivity. The distribution of articles is rather widespread - they published in 462 titles of serials, spanning 110 Journal Citation Reports subject categories. The higher quality journals make publication of findings more visible. A Pearson’s correlation coefficient is statistically found to be significant between citation frequency of article and impact factor of journal, instead of authorship pattern. The results also indicate that R&D expenditures were actually not proportional to research productivity or citation counts. As the subject highly interacts with other disciplines, the field of KM has not yet developed its own body of literature. KM might have been evolving an interdisciplinary theory that is developing at the boundaries of scientific disciplines.

Keywords: Neural-Networks Research, Research Performance, Modern Science, Impact Factor, Citation, Journals, Collaboration, Indicators, Interdisciplinarity, Productivity

? Karazija, R. and Momkauskaite, A. (2004), The Nobel prize in physics - regularities and tendencies. *Scientometrics*, **61** (2), 191-205.

Full Text: [2004\Scientometrics61, 191.pdf](2004/Scientometrics61,%20191.pdf)

Abstract: Various distributions of the Nobel laureates in physics in the 20th century and their discoveries are considered. It is shown that the time-interval between the discovery and its recognition can be approximately described by a lognormal distribution. The ratio of the numbers of laureates awarded for the experimental and the theoretical discoveries was rather different in various decades; this was determined by some “waves” of discoveries and in the initial period probably by some subjective factors. The probability to obtain this prize for the theorist is larger than for the experimenter. The main part of the awards was given to the scientists working in the main fields of modem physics: small distances and solid state physics. Some fields of physics such as mathematical physics, relativity, statistical physics were ignored completely. The worrying tendency of an increasing average age of laureates towards their retirement age is indicated.

Keywords: Experimental, Nobel Prize, Ratio, Statistical

Velloso, A., Lannes, D. and de Meis, L. (2004), Concentration of science in Brazilian governmental universities. *Scientometrics*, **61** (2), 207-220.

Full Text: [S\Scientometrics61, 207.pdf](S/Scientometrics61,%20207.pdf)

Abstract: Brazilian university-based science has grown rapidly in the last 20 years. Most of the PhD-level teaching, research, and technical publications are based in the government-supported universities, although there are also privately supported universities, which educate a large fraction of Brazilian attorney, business people, and other professions. We investigate here the relationship between type of university, numbers of degree program offered, number of faculty members, and number of published papers. Twelve universities, all government supported, are found to produce a very large fraction of publications and to house the best qualified PhD programs. We find that there is a strong correlation between research carried out with foreign collaborators and rate at which the resulting publications are cited. This trend is characteristic of many developing and less developed nations.

Keywords: International Collaboration

Klaić, Z.B. and Klaić, B. (2004), Croatian scientific publications in top journals according to the *Science Citation Index* for the 1980-2000 period. *Scientometrics*, **61** (2), 221-251.

Full Text: [S\Scientometrics61, 221.pdf](S/Scientometrics61,%20221.pdf)

Abstract: A top journal is defined as a journal which is within the first 10% of journals ranked by impact factor in the SCI list, within a particular scientific subfield, for the year considered. Journals which were for 11 or more years within the first 10% were considered top journals during the whole period even though they were not within the first 10%, in some of the years covered by this study.

In the period from 1980 to 2000, the Croatian scientists affiliated with research institutions within the Republic of Croatia, published a total of 13,021 papers in journals covered by the Science Citation Index (SCI). Out of these papers, only 2,720 were published in top journals. This amounts to 20.9% of the total, and this is below the world average of 29.5% for the same scientific subfields. Out of the above 2,720 publications, 1,250 (46.0%) were published in international collaboration, and 335 (12.3%) papers were Meeting Abstracts. The Croatian scientists were most productive in the main scientific fields: Physics (875 papers, 32.2%), Medicine (786 papers, 28.9%), and Chemistry (580 papers, 21.3%). All others fields, taken together, comprised 17.6% of the total scientific output. Of the 786 medical papers, 290 were Meeting Abstracts, or 36.9% of the total output in the field of Medicine, and medical Meeting Abstracts represent 86.6% of the total number of abstracts (33 5). Articles (2,060) represent 75.7% of the total Croatian scientific output in top journals.

Keywords: International Collaboration, Indicators

Gu, Y.N. (2004), Disciplinary determinants of bibliometric impact in Danish industrial research: Collaboration and visibility. *Scientometrics*, **61** (2), 253-270.

Full Text: [S\Scientometrics61, 253.pdf](S/Scientometrics61,%20253.pdf)

Abstract: Firms are increasingly dependent on networks and network visibility for innovation. Bibliometric impact can be regarded as a measure of a firm’s visibility in knowledge-producing networks and may explain why companies publish their results. However, this visibility varies across disciplines. This paper examines publications produced by Danish companies in 1996, 1998 and 2000 to show how citation and collaboration patterns relate in different disciplines. The main findings are that for disciplines characterized by international collaboration and many authors per paper, international collaboration results in a greater number of citations. National collaboration does not, however, seem to make any difference to citation impact in industrial research. In disciplines where multinational collaboration and multi-authorship is uncommon, no clear picture of impact patterns can be obtained. By extension, this research may provide knowledge on how citations of papers in scientific journals can be used as a potential window to scientific networks for firms.

Keywords: Research-and-Development, Co-Authorships, Innovation, Networks, Cooperation, Citation, Progress

Belinchon, I., Ramos, J.M., Sanchez-Yus, E. and Betlloch, I. (2004), Dermatological scientific production from European Union authors (1987-2000). *Scientometrics*, **61** (2), 271-281.

Full Text: [S\Scientometrics61, 271.pdf](S/Scientometrics61,%20271.pdf)

Abstract: To evaluate the contribution to international dermatological literature made by authors from European Union (EU) countries. Using MedLine, a selection was made of articles by EU authors published between 1987 and 2000 in 32 dermatological journals, classified as such by the Institute for Scientific hiformation. Overall 19,225 documents were published by European authors in the selected dermatological journals from 1987 to 2000. The leading countries in terms of output were the United Kingdom, Germany, Italy and France. The leading countries in number of articles after taking into account the gross domestic product and the population were Denmark, Finland and Sweden. The main journals were the British Journal of Dermatology (14.5% of articles from European authors), Contact Dermatitis (13.7%), Journal of Investigative Dermatology (7.3%), Journal of American Academy of Dermatology (6.4%), and Acta Dermato-Venereologica (6.1%). The country with the highest output of papers by journal was the United Kingdom (11 journals) followed by Germany (9 journals), Italy (6 journals), France (3 journals), Spain (2 journals) and Sweden (1 journal). In conclusions: the scientific production of European Union research on dermatology is highest in northern countries.

Keywords: Biomedical Publications, Gastroenterology Research, Journals, Impact, Geography, Articles, Citation, Surgery

? Gu, Y. (2004), Information management or knowledge management? An informetric view of the dynamics of Academia. *Scientometrics*, **61** (3), 285-299.

Full Text: [2004\Scientometrics61, 285.pdf](2004/Scientometrics61,%20285.pdf)

Abstract: This study analyzes the similarities and differences of performance of information management (IM) and knowledge management (KM) research publication indexed by the SCI-EXPANDED, SSCI and A&HCI databases since 1994 with informetric methods in order to explore a developing tendency in the near future. The bibliographic search supplied 1199 IM and 1063 KM records. A very few of IM and KM authors contributed two or more articles. Four countries dominated global IM and KM research productivity, while a few institutions played remarkable roles in scholarly activity. IM journals distributed widespread and 84 per cent just published one or two articles, KM publications were rather concentrated to core and borderline periodicals, fitting Bradford’s law of scattering and. The result of Pearson’s correlation coefficients analysis indicates that the higher the journal impact factor, the more times the published article is cited. The author concludes that KM has been leading IM in both publication productivity and academic population and the tendency is overwhelmingly growing.

Keywords: Impact Factor, Citation, Journals, Patterns, Quality, Bias

? Fernandez-Cano, A., Torralbo, M. and Vallejo, M. (2004), Reconsidering Price’s model of scientific growth: An overview. *Scientometrics*, **61** (3), 301-321.

Full Text: [2004\Scientometrics61, 301.pdf](2004/Scientometrics61,%20301.pdf)

Abstract: This paper presents an overview of the general model of scientific growth proposed by D. J. de Solla Price. Firstly, the formulation of the model is examined using the seminal sources. Later, forerunners, offshoots and criticisms to the model are discussed. Finally, an integrative review using retrieved empirical studies exposes the complexity and diversity of models of scientific growth and the absence of consistent patterns.

Keywords: Big Science, Growth, Indicators, Information, Integrative Review, Journals, Mathematical Approach, Model, Overview, Prediction, Progress, Review, Scientometrics, Technology

? Pinheiro-Machado, R. and Oliveira, P.L. (2004), A comparative study of patenting activity in US and Brazilian scientific institutions. *Scientometrics*, **61** (3), 323-338.

Full Text: [2004\Scientometrics61, 323.pdf](2004/Scientometrics61,%20323.pdf)

Abstract: Patents generated from scientific research indicate academic involvement in technology development. Academic patenting activity is recent, even in developed countries. This study compares patenting activity of Brazilian and American universities. Brazilian universities had 29.5-fold increase in applications and 4.01-fold in grants (1990-2001), about twice the increase presented by American universities in this period. However, a significant fraction of Brazilian academic applications are abandoned due to the lack of specialized staff to help in writing and to shepherd the application through the patenting process in universities. The participation of research institutes in technological innovation is increasing steadily, even without financial incentives.

Keywords: Comparative Study, Development, Incentives, Innovation, Involvement, Patents, Public Science, Research, Scientific Institutions, Scientific Research, Technology, Universities, University, US, Writing

? Guan, J.C. and Ma, N. (2004), A comparative study of research performance in computer science. *Scientometrics*, **61** (3), 339-359.

Full Text: [2004\Scientometrics61, 339.pdf](2004/Scientometrics61,%20339.pdf)

Abstract: The paper compares the research performance in computer science of four major Western countries, India and China, based on the data abstracted from INSPEC database during the period 1993-2002. A total of 9,632 computer science papers recorded in INSPEC database were used for the comparison. The findings indicate that, on the one hand, the number of papers produced in China has considerably increased in the past few years. Particularly, in recent years, China occupies a remarkable high position in terms of counts of papers indexed by the INSPEC database. On the other hand, Chinese scientists preferred to publish in domestic journals and proceedings and shares of SCI-papers to the total journal papers for China have still remained the lowest. This indicates that the research activities of Chinese scientists in computer science are still rather “local” and suffer from a low international visibility. Various scientometric indicators, such as Normalized Impact Factor, ratio of papers in high quality journals are further adopted to analyze research performance and diverse finding are obtained. Nevertheless, for these surrogate indicators, China has optimistically achieved great progress, characterized with “low level of beginning and high speed of developing”. The policy implication of the findings lies in that China, as well as other less developed countries in science, can earn relative competitive advantages in some new emerging or younger disciplines such as computer science by properly using catch-up strategy.

Keywords: Activities, Bibliometrics, China, Citation-Index, Comparative Study, Computer, Growth, Hand, Impact, Impact Factor, India, Indicators, Journal, Journals, Laser Research, Low, Papers, Policy, Quality, Ratio, Research, Research Performance, Science, Scientometrics, Strategy, Visibility

? Bhattacharya, S. (2004), Mapping inventive activity and technological change through patent analysis: A case study of India and China. *Scientometrics*, **61** (3), 361-381.

Full Text: [2004\Scientometrics61, 361.pdf](2004/Scientometrics61,%20361.pdf)

Abstract: The characteristics of Indian and Chinese patenting activity in the US patent system are examined by delineating two categories of patents; ‘nationally assigned’, and ‘invented not nationally assigned’ patents (not-nationally assigned patents in short). Further within the above two categories, patents are distinguished and analysed in terms of patent types: utility, design, and plant patents. Indian patents are mainly of utility type whereas China’s activity falls in both utility and design. In the `nationally assigned’ patents, the different types of institutions involved and linkages are much higher for China. However, ‘not-nationally assigned’ patents of both the countries are dominated by industry and inter-institutional collaborations are sparse. Patents addressing technology sectors (analysis based on utility patents) do not exhibit major differences between the two categories in Chinese patents and address with varying degree all technology sectors. Unlike China, India’s `nationally assigned’ patents are concentrated in chemical and drugs & medical whereas their ‘not-nationally assigned’ patents are similar to that of China in addressing technology sectors. In design patents, Chinese `nationally assigned’ patents mainly cover ornamental design of lighting equipments whereas their ‘not-nationally assigned’ patents are mainly in design equipment for production, distribution or transformation of energy. Further, few firms are active in design patents in both the categories. India’s design activity is insignificant in both the categories. The paper concludes by examining the results in the policy context.

Keywords: Analysis, China, Collaborations, Design, Differences, Drugs, Energy, Falls, India, Indicators, Industry, Medical, Patent, Patents, Performance, Plant, Policy, Statistics, United-States, US

? Christoffersen, M. (2004), Identifying core documents with a multiple evidence relevance filter. *Scientometrics*, **61** (3), 385-394.

Full Text: [2004\Scientometrics61, 385.pdf](2004/Scientometrics61,%20385.pdf)

Abstract: A method to identify core documents within a given subject domain has been developed by the author. The method builds on the concept of polyrepresentation by using different search rationales in several databases and isolating the overlaps between them. This paper delineates the ideas behind the method and describes the study done to measure its effectiveness.

Keywords: Author, Citation Retrieval, Databases, Effectiveness, Overlaps, Searches

Glänzel, W. and Thijs, B. (2004), Does co-authorship inflate the share of self-citations? *Scientometrics*, **61** (3), 395-404.

Full Text: [S\Scientometrics61, 395.pdf](S/Scientometrics61,%20395.pdf)

Abstract: In recent papers, the authors have studied basic regularities of author self-citations. The regularities are related to the ageing, to the relation between self-citations and foreign citations and to the interdependence of self-citations with other bibliometric indicators. The effect of multi-authorship on citation impact has been shown in other bibliometric studies, for instance, by Persson et al. (2004). The question arises whether those regularities imply any relation between number of co-authors and the extent of author self-citations. The results of the present paper confirm the common notion of such effects only in part. The authors show that at the macro level multi-authorship does not result in any exaggerate extent of self-citations.

Kretschmer, H. and Aguillo, I.F. (2004), Visibility of collaboration on the Web. *Scientometrics*, **61** (3), 405-426.

Full Text: [S\Scientometrics61, 405.pdf](S/Scientometrics61,%20405.pdf)

Abstract: The emerging influence of new information and communication technologies (ICT) on collaboration in science and technology has to be considered. In particular, the question of the extent to which collaboration in science and in technology is visible on the Web needs examining. Thus the purpose of this study is to examine whether broadly similar results would occur if solely Web data was used rather than all available bibliometric co-authorship data. For this purpose a new approach of Web visibility indicators of collaboration is examined. The ensemble of COLLNET members is used to compare co-authorship patterns in traditional bibliometric databases and the network visible on the Web. One of the general empirical results is a high percentage (78%) of all bibliographic multi- authored publications become visible through search of engines in the Web. One of the special studies has shown Web visibility of collaboration is dependent on the type of bibliographic multi-authored papers. The social network analysis (SNA) is applied to comparisons between bibliographic and Web collaboration networks. Structure formation processes in bibliographic and Web networks are studied. The research question posed is to which extent collaboration structures visible in the Web change their shape in the same way as bibliographic collaboration networks over time. A number of special types of changes in bibliographic and Web structures are explained.

? Lamirel, J.C., Al Shehabi, S., Francois, C. and Polanco, X. (2004), Using a compound approach based on elaborated neural network for Webometrics: An example issued from the EICSTES project. *Scientometrics*, **61** (3), 427-441.

Full Text: [2004\Scientometrics61, 427.pdf](2004/Scientometrics61,%20427.pdf)

Abstract: This paper present a compound approach for Webometrics based on an extension the self-organizing multimap MultiSOM model. The goal of this new approach is to combine link and domain clustering in order to increase the reliability and the precision of Webometrics studies. The extension proposed for the MultiSOM model is based on a Bayesian network-oriented approach. A first experiment shows that the behaviour of such an extension is coherent with its expected properties for Webometrics. A second experiment is carried out on a representative Web dataset issued from the EISCTES IST project context. In this latter experiment each map represents a particular viewpoint extracted from the Web data description. The obtained maps represented either thematic or link classifications. The experiment shows empirically that the communication between these classifications provides Webometrics with new explaining capabilities.

Keywords: Communication, Information, Map, Model, Network, Neural Network, Precision, Reliability, Webometrics

Meyer, M. and Bhattacharya, S. (2004), Commonalities and differences between scholarly and technical collaboration. *Scientometrics*, **61** (3), 443-456.

Full Text: [S\Scientometrics61, 443.pdf](S/Scientometrics61,%20443.pdf)

Abstract: Co-authorship analysis is a well-established tool in bibliometric analysis. It can be used at various levels to trace collaborative links between individuals, organisations, or countries. Increasingly, informetric methods are applied to patent data. It has been shown for another method that bibliometric tools cannot be applied without difficulty. This is due to the different process in which a patent is filed, examined, and granted and a scientific paper is submitted, refereed and published. However, in spite of the differences, there are also parallels between scholarly papers and patents. For instance, both papers and patents are the result of an intellectual effort, both disclose relevant information, and both are subject to a process of examination. Given the similarities, we shall raise the question as to which extent one can transfer co-authorship analysis to patent data.

? Uzun, A. (2004), Assessing internationality of scholarly journals through foreign authorship patterns: The case of major journals in information science, and scientometrics. *Scientometrics*, **61** (3), 457-465.

Full Text: [2004\Scientometrics61, 457.pdf](2004/Scientometrics61,%20457.pdf)

Abstract: This article reports findings from a study of patterns of foreign authorship of articles, and international composition of journal editorial boards in five leading journals in the field of information science, and scientometrics. The study covers an American journal and four European journals. Bibliographic data about foreign authors and their national affiliation from five selected years of publication were analyzed for all journals. The foreign input of articles were extremely high in Information Processing & Management, and Scientometrics, and were relatively low in the other three journals. The number of foreign countries contributing in all journals have increased rapidly since 1996. Canada, England, Belgium, Netherlands, China, and Spain were the countries with high contributions in JASIST. The authors from the USA have dominated the foreign-authored articles in all European journals. A simple linear regression analysis showed that 60% of variation in the proportion of foreign-authored articles in the set of five journals over the selected years could be explained by the percentage of foreign members on the editorial boards of the journals.

Keywords: Affiliation, Analysis, Authors, Authorship, Belgium, Bibliographic, Bibliometric Analysis, Canada, China, Editorial-Boards, England, Information, Information Science, Journal, Journals, Linear Regression, Low, Management, Publication, Regression Analysis, Scholarly Journals, Science, Scientific Journals, Scientometrics, Spain, USA, Women

? Vaughan, L.W. (2004), Exploring website features for business information. *Scientometrics*, **61** (3), 467-477.

Full Text: [2004\Scientometrics61, 467.pdf](2004/Scientometrics61,%20467.pdf)

Abstract: Two previous webometrics studies found a relationship between the number of inlinks to a commercial site and the company’s business performance measures. Thus inlink counts to commercial sites could be a potential source of business information. However, those studies examined top ranking information technology companies in the U.S. and China. Whether the above-mentioned relationship holds for all companies regardless of ranking and in other countries is unknown. The study reported in this paper investigated this question. The study includes all information technology companies in the U.S. and Canada and gathered both business performance data and website data for these companies. It found significant correlation between business performance measures and inlinks to the company websites. The correlation was still significant even after the size of the company and the website age were accounted for. The conclusion is robust to the search engine used for data collection. Data collection issues for webometrics research were also explored.

Keywords: Bias, Canada, China, Data Collection, Information, Information Technology, Links, Performance Measures, Ranking, Research, Sites, Web Impact Factors, Webometrics, Websites

? Wagner, C.S. (2005), Six case studies of international collaboration in science. *Scientometrics*, **62** (1), 3-26.

Full Text: [2005\Scientometrics62, 3.pdf](2005/Scientometrics62,%203.pdf)

Abstract: Six case studies of international cooperation at the subfield level are presented and compared. The cases examine international collaboration by detailing co-authorship links among researchers by field, evidenced at the level of the nation. Cases are offered based on possible drivers for collaboration: sharing ideas, cooperating around equipment, cooperating around resources, and exchanging data. Scientometric and network analysis of linkages are presented and discussed for each of the six cases: astrophysics, geophysics, mathematical logic, polymers, soil science, and virology, Visualizations of the cosine matrices within each field are compared for 1990 and 2000. The research shows that international collaboration grew in all the fields at rates higher than the international average. The possibility that rapid increases in international collaboration in science can be attributed in part to certain drivers related to access to resources or equipment sharing could not be upheld by the data. Other possible explanations for the rapid growth of collaboration are offered, including the possibility that weak ties evidenced by geographically remote collaboration can promote new knowledge creation.

Keywords: Collaboration, Cooperation, Countries, International Cooperation, Model, Multilateral Co-Authorship, Network, Network Analysis, Patterns, Profiles, Publication, Research, Scientific Collaboration, Virology

? Prpic, K. (2005), Generational similarities and differences in researchers’ professional ethics: An empirical comparison. *Scientometrics*, **62** (1), 27-51.

Full Text: [2005\Scientometrics62, 27.pdf](2005/Scientometrics62,%2027.pdf)

Abstract: This study, based on two empirical investigations undertaken in Croatia on samples of 320 eminent and 840 young researchers, shows a comparison between the professional values/norms of these groups (normative level of research ethics), as well as a comparison (of perceptions) about the frequency of ethically questionable and unacceptable behaviour of researchers in Croatian research institutions (behavioural level of ethos). Science ethics includes a core of cognitive and social standards about which there is relatively high consensus in both groups of researchers. Their cognitive standards correspond to epistemological realism with an accent on objective, reliable, measurable and precise new knowledge. Their basic social values include the broadest social responsibility, responsibility towards colleagues and students, and professionality in relation with funders and/or clients. Thus, research ethos is a combination of traditional cognitive norms and new socially-engaged values. However, research ethics is not a static or homogeneous set of professional values and norms. Young scientists value cognitive norms relating to basic research lower, but rank some cognitive standards more closely linked with applied empirical research higher. Considering the social dimensions of research ethics, young researchers rate traditional academic values of collegiality, commonality and autonomy less important than do eminent scientists, but they hold professionalism and establishing research networks more important. As expected, cognitive and social values and norms are not strictly followed on the level of professional practice. In their everyday professional life eminent and young researchers experience particular questionable research practices that could harm research work and results, and impair collegial relations in science, more often than they encounter breaking social norms that harm or even threaten participants in and users of scientific professional work. Differences in perceiving the incidence of certain kinds of questionable behaviour between the eminent and the young may be attributed to their different professional position and experience.

Keywords: Croatia, Determinants, Differences, Ethics, Frequency, Incidence, Knowledge, Norms, Perceptions, Practice, Productivity, Professional, Professional Practice, Research, Research Institutions, Research Work, Researchers, Responsibility, Science, Scientists, Social, Standards, Students, Traditional

? Carvalho, P., Diniz-Filho, J.A.F. and Bini, L.M. (2005), The impact of Felsenstein’s ‘phylogenies and the comparative method’ on evolutionary biology. *Scientometrics*, **62** (1), 53-66.

Full Text: [2005\Scientometrics62, 53.pdf](2005/Scientometrics62,%2053.pdf)

Abstract: Felsenstein’s (1985) method of phylogenetic independent contrasts is probably the most commonly used technique in evolutionary biology to study adaptation of organisms to their environment, taking phylogeny into account. Here, we performed a scientometric evaluation of all 1462 articles that cited Felsenstein (1985) between 1985 and 2002, in order to analyze the impact of his comparative method on the evolutionary research program and what has been done since it. We found that Felsentein’s (1985) article can be classified as a ‘hot paper’ or a breakthrough contribution, since it was the most cited article from The American Naturalist published in 1985. Also, it can be considered as a ‘citation classic’, since it is the third more cited paper in The American Naturalist from 1945 to 2002. In general, papers that cited Felsenstein (1985) were published in high-impact journals, and most of them are theoretical articles indicating that biologists are aware of statistical and conceptual problems in dealing with comparative methods.

Keywords: Adaptation, Citations, Evaluation, Journals, Patterns, Phylogenetically Independent Contrasts, Power, Progress, Regression, Research, Science, Scientometric

Engels, A., Ruschenburg, T. and Weingart, P. (2005), Recent internationalization of global environmental change research in Germany and the US. *Scientometrics*, **62** (1), 67-85.

Full Text: [S\Scientometrics62, 67.pdf](S/Scientometrics62,%2067.pdf)

Abstract: Programs in global environmental change research call for sweeping international cooperation and the creation of global networks. This paper analyzes to what extent research institutions in the field of global environmental change have responded to this call. Several bibliometric indicators of internationalization are discussed. A German and a U.S. sample are compared. The results indicate that a very discernable trend of recent internationalization can be observed. This is in line with a general internationalization trend across all fields, but at a much higher level. Given the political emphasis on capacity building in developing countries in this research field, however, there is only weak evidence of a more encompassing globalization process which also includes marginal world regions. Finally, the internationalization trend does not coincide with de-nationalization.

Keywords: Scientific Collaboration, Countries, Science, Model

Tuzi, F. (2005), The scientific specialisation of the Italian regions. *Scientometrics*, **62** (1), 87-111.

Full Text: [S\Scientometrics62, 87.pdf](S/Scientometrics62,%2087.pdf)

Abstract: The possible existence of specialisation patterns by research fields of the Italian regions is investigated. Accordingly, bibliometric data on papers published in international scientific journals have been processed and tailored for regional comparative analysis. The results show that the trends in scientific regional specialisation are related to the research activities performed by each scientific system, but also the regional industrial skill is very often reflected in the corresponding scientific profile.

The empirical evidences show also that each Italian region works as a well identifiable scientific system providing for its own specific contribution to the national performance.

Keywords: 27 Science Areas, Publication Output, Citation Impact, National Performances, Scientometric Weight, World Science, Life Sciences, Indicators, Physics, Mathematics

? Ball, R. and Glänzel, W. (2005), The German experience in the applications, benefits and limitations of evaluative bibliometrics in a policy-relevant context - Preface. *Scientometrics*, **62** (1), 115-116.

Full Text: [2005\Scientometrics62, 115.pdf](2005/Scientometrics62,%20115.pdf)

Keywords: Bibliometrics

Weingart, P. (2005), Impact of bibliometrics upon the science system: Inadvertent consequences? *Scientometrics*, **62** (1), 117-131.

Full Text: [S\Scientometrics62, 117.pdf](S/Scientometrics62,%20117.pdf)

Abstract: The introduction of bibliometric (and other) ranking is an answer to legitimation pressures on the higher education and research system. After years of hesitation by scientists, science administrators and even politicians in many of the industrialized countries, the implementation of bibliometrics based (and other types of) rankings for institutions of higher education and research is now being introduced on a full scale. What used to be an irritation to the parties concerned has suddenly become a fad. In contrast to this rather sudden enthusiasm, there is very little reflection on the impacts of this practice on the system itself. So far empirical data on the impact of bibliometric rankings seem to be available only for two cases: Australia and the British research assessment exercise (RA-E). Thus, the actual steering effects of bibliometric rankings, the reactions of the system are largely unknown. Rankings are in urgent demand by politics. The intended effect is to create competition among institutions of higher learning and research and thereby to increase their efficiency. The rankings are supposed to identify excellence in these institutions and among researchers. Unintended effects may be ‘oversteering’, either by forcing less competitive institutions to be closed down or by creating oligopolies whose once achieved position of supremacy cannot be challenged anymore by competitors. On the individual level the emergence of a kind of ‘chart’ of highly cited stars in science can already be observed (ISI HighlyCited.com). With the spread of rankings the business administration paradigm and culture is diffused through the academic system. The commercialization of ranking is most pronounced in the dependence of the entire practice on commercial providers of the pertinent data. As products like IST’s Essential Science Indicators become available, their use in the context of evaluation tasks is increasing rapidly. The future of the higher education and research system rests on two pillars: traditional peer review and ranking. The goal must be to have a system of informed peer review which combines the two. However, the politicized use of numbers (citations, impact factors, funding etc.) appears unavoidable.

Keywords: Citation, Indicators, Authors, Editors, Rank

Van Raan, A.F.J. (2005), Fatal attraction: Conceptual and methodological problems in the ranking of universities by bibliometric methods. *Scientometrics*, **62** (1), 133-143.

Full Text: [S\Scientometrics62, 133.pdf](S/Scientometrics62,%20133.pdf)

Abstract: Ranking of research institutions by bibliometric methods is an improper tool for research performance evaluation, even at the level of large institutions. The problem, however, is not the ranking as such. The indicators used for ranking are often not advanced enough, and this situation is part of the broader problem of the application of insufficiently developed bibliometric indicators used by persons who do not have clear competence and experience in the field of quantitative studies of science. After a brief overview of the basic elements of bibliometric analysis, I discuss the major technical and methodological problems in the application of publication and citation data in the context of evaluation. Then I contend that the core of the problem ties not necessarily at the side of the data producer. Quite often persons responsible for research performance evaluation, for instance scientists themselves in their role as head of institutions and departments, science administrators at the government level and other policy makers show an attitude that encourages, quick and dirty’ bibliometric analyses whereas better quality is available. Finally, the necessary conditions for a successful application of advanced bibliometric indicators as support tool for peer review are discussed.

Keywords: National Research Performance, Impact-Factors, International Comparisons, Citation, Science, Indicators, Consequences, Coverage

? Wagner-Dobler, R. (2005), The system of research and development indicators: Entry points for information agents. *Scientometrics*, **62** (1), 145-153.

Full Text: [2005\Scientometrics62, 145.pdf](2005/Scientometrics62,%20145.pdf)

Abstract: A system of input, output, and efficiency indicators is sketched out, with each indicator related to basic research, applied research, and experimental development. Mainly, this scheme is inspired by empirical innovation economics (represented in Germany, e.g., by H. Grupp) and by ‘advanced bibliometrics’ and scientometrics (profiled by van Raan and others). After considering strengths and weaknesses of some of the indicators, possible additional ‘entry points’ for institutions of information delivery are examined, such contributing to an enrichment of existing indicators. And to a ‘Nationalokonomik des Geistes’, requested from librarians in the twenties of the last century by A. von Harnack.

Keywords: Development, Economics, Innovation, Research, Research And Development, Scientometrics

? Bayers, N.K. (2005), Using ISI data in the analysis of German national and institutional research output. *Scientometrics*, **62** (1), 155-163.

Full Text: [2005\Scientometrics62, 155.pdf](2005/Scientometrics62,%20155.pdf)

Abstract: This paper discusses the Thomson ISI Research Services Group approaches to analyzing the world research environment, particularly in terms of comparing research performance among nations and institutions. This discussion concentrates on the recent research environment -1998-2002- beginning first with comparisons among selected nations overall, in terms of publications-an indicator of research output and productivity; and citations-an indicator of research impact and influence. The second part addresses the German research landscape and concludes with an analysis of the contributions of specific German institutions to Germanys’ research performance.

Keywords: Analysis, Environment, Impact, ISI, ISI-Data, Productivity, Research, Research Impact, Research Output, Research Performance

Sommer, S. (2005), Bibliometric analysis and private research funding. *Scientometrics*, **62** (1), 165-171.

Full Text: [2005\Scientometrics62, 165.pdf](file:///H:\Bibliometric%20References\2005\Scientometrics62,%20165.pdf)

Abstract: This paper outlines how private institutions and particularly foundations contribute to the furtherance of higher education and research, and it depicts what role bibliometric analysis can or cannot play in foundations’ private research funding and in the process of strategic realignment under financial constraints.

? Goebelbecker, J. (2005), The role of publications in the new programme oriented funding of the Hermann von Helmholtz Association of National Research Centres (HGF). *Scientometrics*, **62** (1), 173-181.

Full Text: [2005\Scientometrics62, 173.pdf](2005/Scientometrics62,%20173.pdf)

Abstract: The year 2002 brought a successive funding change-over from until now institutional to programme oriented funding (POF) in the Helmholtz Association of German Research Centres (HGF). This way the 15 German research centres now have to generate their means successively from programmes of the research fields of the HGF (see: www.helmholtz.de) by competing with each other. This nucleus of the reform of the Association is being implemented based upon the opinion of international experts. In this context the evaluation of publications of individual research centres, resp. research groups will be playing an ever increasing part. This lecture will inform about the reformed, partially formalized system and first experiences therewith at the time of the first evaluations.

Keywords: Evaluation, Funding, POF, Publications, Research

? Wang, Y., Wu, Y.S., Pan, Y.T., Ma, Z. and Rousseau, R. (2005), Scientific collaboration in China as reflected in co-authorship. *Scientometrics*, **62** (2), 183-198.

Full Text: [2005\Scientometrics62, 183.pdf](2005/Scientometrics62,%20183.pdf)

Abstract: Co-authorship patterns derived from 1997-2001 data in the CSTPC Database (Chinese Science and Technology Papers and Citations Database) are analyzed to show the status of science and technology collaboration in China. Four different collaborative types, namely papers co-authored by the authors in the same institution (SI), in different institution located in the same region (SR), in different regions (DR) of China, and in different countries or regions of the world (DC) are discussed, The regional and subject distributions of co-authored papers as well as the general status of collaboration in science and technology in China are studied. It is concluded that, for all four collaborative types, collaboration in science and technology has increased in China. Different regions have different collaborative patterns corresponding to economic, technological and scientific development levels. Differences in collaborative patterns in terms of subjects are explained by different characteristics of the subjects themselves.

Keywords: Authors, China, Citations, Co-Authorship, Coauthorship, Collaboration, Cooperation, Database, Development, Geographical Proximity, Networks, Papers, Patterns, Science, Science and Technology, Scientific Collaboration, Technology

? Kostoff, R.N. and Shlesinger, M.F. (2005), CAB: Citation-assisted background. *Scientometrics*, **62** (2), 199-212.

Full Text: [2005\Scientometrics62, 199.pdf](2005/Scientometrics62,%20199.pdf)

Abstract: A chronically weak area in research papers, reports, and reviews is the complete identification of background documents that formed the building blocks for these papers. A method for systematically determining these seminal references is presented. Citation-Assisted Background (CAB) is based on the assumption that seminal documents tend to be highly cited. CAB is being applied presently to three applications studies, and the results so far are much superior to those used by the first author for background development in any other study. An example of the application of CAB to the field of Nonlinear Dynamics is outlined. While CAB is a highly systematic approach for identifying seminal references, it is not a substitute for the judgement of the researchers, and serves as a supplement.

Keywords: Accuracy, Author, Development, Dynamics, Highly-Cited, Journals, Nonlinear, Papers, Proposal, Quotation, Research, Research Papers, Researchers, Systematic

? Pouris, A. (2005), An assessment of the impact and visibility of South African journals. *Scientometrics*, **62** (2), 213-222.

Full Text: [2005\Scientometrics62, 213.pdf](2005/Scientometrics62,%20213.pdf)

Abstract: The assessment of scientific journals is of particular interest to South Africa’s higher education institutions as their research is partly funded according to the number of publications of their members of staff. This article has two objectives. The first one is to identify the effects of the government’s withdrawal of financial support on these journals’ impact factors. The second objective is to provide an assessment of the visibility of the South African journals indexed in the Journal Citation Report (JCR) of the 2002. The findings indicate that the termination of the government interference in the affairs of the journals had on average a beneficial effect on the impact factors of the journals. South Africa is found to have a good representation in the JCR, similar or better to that of the scientifically small countries in Europe, and represents approximately 90% of the African continent journals in the JCR. ne visible scientific disciplines are identified and the journals are assessed according to their impact factors, to the impact factors of journals citing them, and the self-citing and self-cited rates.

Keywords: Africa, Assessment, Citation, Education, Europe, Financial Support, Higher Education, Impact, Impact Factors, Interest, JCR, Journal, Journals, Publications, Research, Scientific Journals, South Africa, Visibility

? Hassan, E. (2005), The evolution of the knowledge structure of fuel cells. *Scientometrics*, **62** (2), 223-238.

Full Text: [2005\Scientometrics62, 223.pdf](2005/Scientometrics62,%20223.pdf)

Abstract: Recognizing the critical role played by science and technology in the development of fuel cells, this article aims to characterize the evolution of the S&T knowledge bases of fuel cells over the nineties, using data on patents and scientific publications. The field of fuel cells is particularly heterogeneous. It covers diverse sub-fields that are marked by idiosyncratic characteristics (e.g. actors, demand, and input) and different historical developments. Although this heterogeneity of the field of fuel cells is reflected in the dynamics of S&T knowledge generation within and across its sub-fields too, this article shows that it does not entail the absence of cognitive interrelations between their S&T knowledge bases. For that purpose, the article uses “simultaneous mapping” approach of their S&T knowledge bases by means of textual analysis.

Keywords: Academic Research, Analysis, Basic Research, Development, Evolution, Innovations, Knowledge, Linkage, Networks, Patents, Publications, Science, Science and Technology, Scientific Publications, Technology

? Moin, M., Mahmoudi, M. and Rezaei, N. (2005), Scientific output of Iran at the threshold of the 21st century. *Scientometrics*, **62** (2), 239-248.

Full Text: [2005\Scientometrics62, 239.pdf](2005/Scientometrics62,%20239.pdf)

Abstract: This study evaluates the scientific output of Iran over the past two decades. The information has been extracted by searching ISI in December 2003. Science production in Iran has been reviewed (1967-2003) and compared with 15 countries in the year 2000. During these years Iran’s relative share in the scientific output in the world increased from 0.0003% in 1970 to 0.29% in 2003. Comparing the ratio of science output to GNP, Iran stands on thirteenth place among 16 countries in the year 2000. ne present article discusses that Iran has had an increasing growth in presenting articles after the Iraq-Iran war, which marks the period of stability and development.

Keywords: Citation Analysis, Development, Different Countries, Economics, Growth, Impact Factor, Information, Iran, ISI, Journals, Ophthalmology, Publications, Ratio, Science, Scientific Output, Stability, Tool

He, T.W., Zhang, J.L. and Teng, L.R. (2005), Basic research in biochemistry and molecular biology in China: A bibliometric analysis. *Scientometrics*, **62** (2), 249-259.

Full Text: [S\Scientometrics62, 249.pdf](S/Scientometrics62,%20249.pdf)

Abstract: Using the method of bibliometrics, a 1999-2002 biochemistry and molecular biology database was constructed for China from the Science Citation Index Expanded (SCI-Expanded). Based on this database, the author quantitatively analyzed the current research activity in biochemistry and molecular biology in China. Results show that almost half the publications were published in Chinese journals. The percentage of articles published by Chinese authors in the total articles from the world is increasing. The number of articles published in high influence journals is continuously increasing. The research outputs are mainly located in Beijing, Shanghai and Hong Kong. The sites of the China Science Academy and National Universities are the important locations for these studies. The collaboration rate of Chinese output is low as compared to results from other countries. USA and Japan are the main international collaborating countries.

Keywords: Research Performance, Science Fields, Indicators

? Kademani, B., Kalyane, V., Kumar, V. and Mohan, L. (2005), Nobel laureates: Their publication productivity, collaboration and authorship status. *Scientometrics*, **62** (2), 261-268.

Full Text: [2005\Scientometrics62, 261.pdf](2005/Scientometrics62,%20261.pdf)

Abstract: This paper attempts to highlight the scientific productivity, productivity age, collaboration trend, domains of contributions of eight Nobel laureates of past and present belonging to different domains of research in science. Also attempts to document the various factors that affect productivity of scientists. No Nobel laureates can be compared with other Nobel laureates as they are an altogether different class of scientific elites and each piece of research is unique by itself.

? Geisler, E. (2005), The measurement of scientific activity: Research directions in linking philosophy of science and metrics of science and technology outputs. *Scientometrics*, **62** (2), 269-284.

Full Text: [2005\Scientometrics62, 269.pdf](2005/Scientometrics62,%20269.pdf)

Abstract: The application of the measurement of scientific and technical activities has been a lengthy process of the appropriate metrics and the assignment of the standards and benchmarks for their usage. Although some studies have addressed issues of the management of science and technology and their relation to scientometrics and infometrics, there is nevertheless a need to consider the linkages between the conceptual background of scientific generation and progress - and the measurement of its process and outcomes. This paper first reviews the three main approaches to the generation and progress of human knowledge in general and scientific activity in particular. These approaches are reviewed in terms of the demands they would make on the measurement of scientific process and outputs. The paper then examines the currently used categories of metrics, and arrives at several conclusions. The paper provides an analysis of these conclusions and their implications to the generation and utilization of metrics of science and its outcomes. The review of the conceptual or philosophical foundations for the measurement of science offers an in-depth examination, resulting in the correlation of these foundations with the metrics we now use to measure science and its outcomes. The paper suggests research directions for a much needed link between theories of science and knowledge, and the application of metrics used to measure them. Finally, the paper offers several hypotheses and proposes potential empirical studies.

Somogyi, A. and Schubert, A. (2005), Correlation between national bibliometric and health indicators: The case of diabetes. *Scientometrics*, **62** (2), 285-292.

Full Text: [2005\Scientometrics62, 285.pdf](2005/Scientometrics62,%20285.pdf)

Abstract: Correlation between diabetes-related publication output and diabetes prevalence was sought and found in a sample of world countries and in the states of the US. Various correlation patterns (‘demand driven research’, ‘research driven prevention’, no correlation) were distinguished and interpreted.

? Xekalaki, E. (2005), Comments on the paper of Shan et al.: The multivariate Waring distribution. *Scientometrics*, **62** (2), 293-296.

Full Text: [2005\Scientometrics62, 293.pdf](2005/Scientometrics62,%20293.pdf)

Keywords: Accident Theory, Identifiability, Regression, Yule Distribution

? Braun, T. and Diospatonyi, I. (2005), The counting of core journal gatekeepers as science indicators really counts. The scientific scope of action and strength of nations. *Scientometrics*, **62** (3), 297-319.

Full Text: [2005\Scientometrics62, 297.pdf](2005/Scientometrics62,%20297.pdf)

Keywords: Citation Patterns, Editors, Journal, Science, Strength

? Egghe, L. (2005), A characterization of the law of Lotka in terms of sampling. *Scientometrics*, **62** (3), 321-328.

Full Text: [2005\Scientometrics62, 321.pdf](2005/Scientometrics62,%20321.pdf)

Abstract: An incomplete bibliography (or, more generally, an incomplete Information Production Process (IPP)) can be considered as a sample from a complete one. Sampling can be done in the sources or in the items. The simplest sampling technique is the systematic one where every k(th) source or k(th) item is taken (alternatively: deleted) (k is an element of N). In this paper we give a definition of systematic sampling in items and sources in the framework of an IPP in which we have continuous variables. We prove the theorem that in such IPPs we have a Lotkaian size-frequency function (i.e. a decreasing power function) if and only if systematic sampling in sources is the same as systematic sampling in items. In this proof we use the well-known characterization of power functions as scale-free functions.

Keywords: Bibliography, Characterization, Networks, Power, Systematic

? Santos, J.B. and Ortega-Irizo, F.J. (2005), Modelling citation age data with right censoring. *Scientometrics*, **62** (3), 329-342.

Full Text: [2005\Scientometrics62, 329.pdf](2005/Scientometrics62,%20329.pdf)

Abstract: in order to model the variable T (the age of citations received by scientific works) with data elaborated by the Institute of Scientific Information, we have used some of the instruments already developed in the survival models to this type of retrospective analyses in the presence of censored data. This analysis is used because, usually, the citations of ages greater than or equal to 10 years appear added together. For a set of journals related to the field of Applied Economics, we have explored which models fit better among those commonly used. Two different approaches to assess the goodness-of-fit for each selected model have been suggested: an analysis through graphical methods and a formal analysis to estimate the parameters of each model by the method of maximum likelihood estimation with data censored to the right.

Keywords: Analysis, Citation, Citations, Economics, Journals, Model, Scientific Information, Survival

? Bonitz, M. (2005), Klaus Fuchs - The enduring contribution to physics from his British period. *Scientometrics*, **62** (3), 343-350.

Full Text: [2005\Scientometrics62, 343.pdf](2005/Scientometrics62,%20343.pdf)

Abstract: Klaus Fuchs, during his years in England as an immigrant, has written 20 scientific papers. One of these papers, published in 1938, became a fundamental text in solid state physics and for the development of microelectronics in succeeding decades. It was cited more than 1200 times in the period from 1945 until 2003. It appears to be a typical case of delayed recognition in science. Pioneering papers simultaneously written by Hahn P StraBmann and by Meitner P Frisch on the discovery of nuclear fission are considered for comparison.

Keywords: Contribution, Development, England, Immigrant, Papers, Science

? Keiser, J. and Utzinger, J. (2005), Trends in the core literature on tropical medicine: A bibliometric analysis from 1952-2002. *Scientometrics*, **62** (3), 351-365.

Full Text: [2005\Scientometrics62, 351.pdf](2005/Scientometrics62,%20351.pdf)

Abstract: The medical specialty of ‘tropical medicine’ only dates back a little more than 100 years and, in the meantime, has gone through several quite distinctive eras. The aim of our study was to investigate trends that occurred in the leading literature on tropical medicine over the past 50 years. We analysed 2,802 original articles published in 1952, 1962, 1972, 1982, 1992 and 2002 in five of the high impact factor journals, namely (i) Acta Tropica, (II) American Journal of Tropical Medicine and Hygiene, (iii) Annals of Tropical Medicine and Parasitology, (iv) Leprosy Review, and (v) Transactions of the Royal Society of Tropical Medicine and Hygiene. Authors’ country affiliations were categorized according to the human development index 2003 (HDI), with stratification into low, medium and high HDI. We observed the following trends: First, there was a strong increase in the number of articles published from 250 in 1952 to 726 in 2002. Second, over the same time span, the median number of authors per article increased from I (four journals) or 2 (American Journal of Tropical Medicine and Hygiene) to 2.5 (Leprosy Review) up to 6 (Acta Tropica and American Journal of Tropical Medicine and Hygiene). Third, research collaborations between countries of different HDI ranks increased concomitantly - in 2002, 19.4-43.7% of all manuscripts comprised authors from different HDI countries - indicating that tropical medicine has become a global endeavour. However, in four of the five journals investigated, the overall percentage of researchers affiliated with low HDI countries decreased over the past 50 years and only a slight positive trend can be observed over the last decade. Concluding, current roadblocks should be identified and programmes designed and implemented to enhance equity of publishing in tropical medicine. This in cum might be an important step forward to substantially reduce the current burden of tropical diseases, so that social and economic development in the tropics and subtropics can be advanced and poverty alleviated.

Keywords: Multiple Authorship, Public-Health, Countries, Journals, Science, Africa

? Simkin, M.V. and Roychowdhury, V.P. (2005), Stochastic modeling of citation slips. *Scientometrics*, **62** (3), 367-384.

Full Text: [2005\Scientometrics62, 367.pdf](2005/Scientometrics62,%20367.pdf)

Abstract: We present empirical data on frequency and pattern of misprints in citations to twelve high-profile papers. We find that the distribution of misprints, ranked by frequency of their repetition, follows Zipfs law. We propose a stochastic model of citation process, which explains these findings, and leads to the conclusion that about 70-90% of scientific citations are copied from the lists of references used in other papers.

Keywords: Citation, Citations, Frequency, Model, Modeling, Networks, Ortega Hypothesis, Papers, Process, Science

? Liu, Z. (2005), Visualizing the intellectual structure in urban studies: A journal co-citation analysis (1992-2002). *Scientometrics*, **62** (3), 385-402.

Full Text: [2005\Scientometrics62, 385.pdf](2005/Scientometrics62,%20385.pdf)

Abstract: This paper studied the intellectual structure of urban studies through a co-citation analysis of its thirty-eight representative journals from 1992 to 2002. Relevant journal co-citation data were retrieved from Social SciSearch, and were subjected to cluster analysis, multidimensional scaling, and factor analysis. A cluster-enhanced two-dimensional map was created, showing a noticeable subject variation along the horizontal axis depicting four clusters of journals differentiated into mainstream urban studies, regional science and urban economics, transportation, and real estate finance. The cluster of the mainstream urban studies journals revealed a higher degree of interdisciplinarity than other clusters. The four-factor solution, though not a perfect match for the cluster solution, demonstrated the interrelationships among the overlapping journals loaded high on different factors. The results also showed a strong negative correlation between the coordinates of the horizontal axis and the mean journal correlation coefficients reflecting the subject variation, and a less revealing positive correlation between the coordinates of the vertical axis and the mean journal correlation coefficients.

Keywords: Analysis, Author Cocitation, Co-Citation Analysis, Cocitation, Economics, Factor-Analysis, Intellectual Structure, Interdisciplinarity, Journal, Journals, Overlapping, Science, Scientific Literatures, Transportation, Urban

? Gordon, A. (2005), The peripheral terrorism literature: Bringing it closer to the core. *Scientometrics*, **62** (3), 403-414.

Full Text: [2005\Scientometrics62, 403.pdf](2005/Scientometrics62,%20403.pdf)

Abstract: Core/periphery scientific communication is important for information transfer in terrorism literature. The mutual awareness between disciplinary journals contributors in the mainstream and those in the margins of the field enhances their social interaction. The usual case is that the mainstream of a discipline is visible through such indexes as the Web of Science (SCI) and the Journal Citation Report (JCR) the second of which assigns an impact factor to the most cited journals. In terrorism subject area, however, the reverse situation exists; only the peripheral journals in this field are indexed in JCR. From a scientific communication perspective, then, the core journals of terrorism writings are relatively invisible. This study attempts to identify the core and the periphery of journals dealing with terrorism, and suggests a way to bring them closer together. The assumption is that the quality and quantity of work in this field will increase as the distance between these two poles decreases.

Keywords: Awareness, Citation, Communication, Impact, Impact Factor, Indexes, Information, JCR, Journal, Journals, Literature, Quality, SCI, Science, Scientific Communication, Social, Terrorism, Web of Science

Chiu, W.T. and Ho, Y.S. (2005), Bibliometric analysis of homeopathy research during the period of 1991 to 2003. *Scientometrics*, **63** (1), 3-23.

Full Text: [S\Scientometrics63, 3.pdf](S/Scientometrics63,%203.pdf)

Abstract: Homeopathy has been applied to clinical use since it was first presented 200 years ago. The use of the bibilometric analysis technique for examining this topic does not exist in the literature. The objective of this study is to conduct a bibliometric analysis of all homeopathy-related publications in Science Citation Index (SCI). A systematic search was performed using the SCI for publications during the period of 1991 to 2003. Selected documents included ‘Homoeopathy, Homoeopathic, Homeopathy, or Homeopathic’ as a part of the title, abstract, or keywords. Analyzed parameters included authorship, patterns of international collaboration, journal, language, document type, research address, number of times cited, and reprint author’s address. Citation analysis was mainly based on the impact factor as defined by the Journal Citation Reports (JCR) and on citations per publications (CPP), which is used to assess the impact relative to the entire field and is defined as the ratio between the average numbers of citations per publications in a certain period. Of total articles, 49% had a single author. The UK, the US, and Germany produced 71% of the total output, while European countries as a whole also contributed 65% of the total share of independent publications. English remains the dominant language, it comprised only 76%, while German contributed 18%, and the remaining where distributed among 8 European languages. More document types and languages, and fewer pages have appeared in homeopathy research. 3.5% of papers were cited more than 10 times in three years after publication, and 60% were never cited. Small-group collaboration was a popular method as co-authorship. The top 3 ranking countries of publication were the UK, the US, and Germany. The US dominated citation followed by the UK, and then Germany. In addition, a simulation model was applied to describe the relationship between the cumulative number of citations and the paper life.

Keywords: Analysis, Author, Authorship, Bibliometric, Bibliometric Analysis, Citation, Citation Analysis, Citations, Co-Authorship, Coauthorship, Collaboration, Document Types, English, Germany, Impact, Impact Factor, International Collaboration, JCR, Journal, Journal Citation Reports, Literature, Medicine, Model, Papers, Publication, Publications, Ranking, Ratio, Reports, Research, SCI, Science, Science Citation Index, Simulation, Systematic, UK, US

? Yu, G., Yu, D.R. and Li, Y.J. (2005), A simulation study of the periodicals’ publication delay control process. *Scientometrics*, **63** (1), 25-38.

Full Text: [2005\Scientometrics63, 25.pdf](2005/Scientometrics63,%2025.pdf)

Abstract: According to the discrete model of periodical publication process, recurrence formulae of parameters of the process are gained and the initial conditions of control process parameters from one steady state to another are deduced. Using the variable separation approach, which is used generally to solve the partial differential equation, the recurrence computing formula of the publication probability function is deduced. First the publication delay increasing process caused by the accepted contribution flux increase is simulated, and then the publication delay decreasing processes under four different control means are simulated too. Finally it is demonstrated that the periodical publishing process is a strong inertia system and it is found that reducing the quantity of deposited contributions can shorten the publication delay.

Keywords: Contribution, Control, Model, Periodical, Periodicals, Process, Process Parameters, Publication, Publishing, Recurrence, Separation, Simulation

? Ynalvez, M., Duque, R.B., Mbatia, P., Sooryamoorthy, R., Palackal, A. and Shrum, W. (2005), When do scientists “adopt” the Internet? Dimensions of connectivity in developing. *Scientometrics*, **63** (1), 39-67.

Full Text: [2005\Scientometrics63, 39.pdf](2005/Scientometrics63,%2039.pdf)

Abstract: We examine the diffusion of information and communication technologies (ICTs) in the knowledge production sectors of three developing areas. Using interviews with 918 scientists in one South Asian and two African locations, we address three fundamental questions: (1) To what degree has the research community in the developing world adopted the Internet? (2) How can the disparities in Internet adoption best be characterized? (3) To what extent is Internet use associated with research productivity? Our findings indicate that while the vast majority of scientists describe themselves as current email users, far fewer have ready access to the technology, use it in diverse ways, or have extensive experience. These results are consistent with the notion that Internet adoption should not be characterized as a single act on the part of users. The rapid development of the Internet and the cumulative skills required for its effective use are equally important, particularly its impact on productivity. These findings lead us to qualify crude generalizations about the diffusion of the Internet in developing areas.

Keywords: Communication, Countries, Development, Diffusion, Disparities, Email, Gender, Impact, Information, Internet, Internet Adoption, Knowledge, Lead, Productivity, Publications, Research, Research Productivity, Science, Universities, Usage, World

? Frandsen, T.F. (2005), Geographical concentration: The case of economics journals. *Scientometrics*, **63** (1), 69-85.

Full Text: [2005\Scientometrics63, 69.pdf](2005/Scientometrics63,%2069.pdf)

Abstract: The purpose of this paper is to investigate whether geographical concentration can act as a supplement to the Journal Impact Factor (JIF). The results indicate that the use of a geographical concentration measure opens up new possibilities for analyses of the development of geographic diversion over time. In contrast to measures used in earlier studies the precise strength of the geographical concentration index as a measure of diversion is that it represents diversion as a single value that can be followed over time. The results show wider geographic distribution of European economics journals in the 1980s compared to the American economics journals whereas there seems to be no difference in geographic dispersion in the 1990s.

Keywprds: Research Output, Impact, Diffusion, American, Rankings, Science

? Bonaccorsi, A. and Daraio, C. (2005), Exploring size and agglomeration effects on public research productivity. *Scientometrics*, **63** (1), 87-120.

Full Text: [2005\Scientometrics63, 87.pdf](2005/Scientometrics63,%2087.pdf)

Abstract: The paper assesses the empirical foundation of two largely held assumptions in science policy making, namely scale and agglomeration effects. According to the former effect, scientific production may be subject to increasing returns to scale, defined at the level of administrative units, such as institutes or departments. A rationale for concentrating resources on larger units clearly follows from this argument. According to the latter, scientific production may be positively affected by external economies at the geographical level, so that concentrating institutes in the same area may improve scientific spillover, linkages and collaborations. Taken together, these arguments have implicitly or explicitly legitimated policies aimed at consolidating institutes in public sector research and at creating large physical facilities in a small number of cities. The paper is based on the analysis of two large databases, built by the authors from data on the activity of the Italian National Research Council in all scientific fields and of the French INSERM in biomedical research. Evidence from the two institutions is that the two effects do not receive empirical support. The implications for policy making and for the theory of scientific production are discussed.

Keywords: Academic Research, Analysis, Authors, Biomedical, Biomedical Research, Collaborations, Databases, Departments, Economies, French, Higher-Education, Knowledge, Performance-Measures, Policies, Policy, Policy Making, Productivity, Public Research, Research, Research Productivity, Research Universities, Scale, Science, Science Policy, Scientific Production, Scientific Productivity, Spillovers, Theory

? Jeannin, P. and Devillard, J. (2005), Implementing relevant disciplinary evaluations in the social sciences - National vs international interactions in scientific communities. *Scientometrics*, **63** (1), 121-144.

Full Text: [2005\Scientometrics63, 121.pdf](2005/Scientometrics63,%20121.pdf)

Abstract: This paper addresses the issue of relevancy when tackling the problem of the evaluation of research published in Social Science journals. This evaluation initialy relies on a critical selection of the databases scientists use. To implement relevant disciplinary evaluations, the method also needs to be scientific, ethical, replicable, comprehensive, flexible, transparent, accessible, incentive, productive, updatable and “internationalizable”. This qualitative approach takes into account the current global environment of research. Our method - introducing these criteria - consists in selecting the bases (either bases from the Institute for Scientific Information or not) scientists favour, in crossing them to elaborate new lists of journals, in testing them, in launching a life-size survey among scientists. This method stands as a prerequisite for further applications. Beyond this rather constructivist approach, such evaluations of research can benefit to all the actors participating in the process of the dissemination of knowledge. The need for an international cooperation in coming up with relevant evaluation criteria and indexes is put forward when implementing these sets of evaluation. The appendix presents a case study on French sociology.

Keywords: Cooperation, Databases, Dissemination, Environment, Evaluation, France, French, Indexes, Journals, Knowledge, Policy, Process, Qualitative, Research, Science, Sciences, Scientific Information, Social, Social Science, Social Sciences, Sociology, State, Survey

? Meyer, M., Du Plessis, M., Tukeva, T. and Utecht, J.T. (2005), Inventive output of academic research: A comparison of two science systems. *Scientometrics*, **63** (1), 145-161.

Full Text: [2005\Scientometrics63, 145.pdf](2005/Scientometrics63,%20145.pdf)

Abstract: This paper compares the inventive output of two science systems in small European countries. More specifically, we examine patented inventions of Finnish and Flemish university researchers. The comparison includes inventive output as such and its concentration on organizations, inventors, and corporate owners as well as foreign assignations and the degree to which individual inventors have retained the ownership of the patents. While there are commonalities between the Finnish and Flemish systems in terms of patent concentration on key institutions and corporate assignees, there are also pronounced differences with respect to the ownership structure of academic patents, which was expected in light of the different intellectual property regulations. Our observations seem to suggest that the total inventive output of a research system is not a function of the prevailing intellectual property system but rather in correspondence to overall national inventiveness thereby pointing to more general (national, cultural) drivers of academic inventive activity. From a methodological viewpoint, this research illustrates that tracing university-owned patents alone would leave considerable technological contributions of academics unidentified - also in countries where universities own the rights to their researchers’ patents. Another finding with potential methodological implications is that patents are highly concentrated on institutions. If such a distribution law applies to large countries as well, analysts could cover most of the national academic patent output by an intelligent selection of universities.

Keywords: Academics, Correspondence, Differences, Flows, Innovation, Patent, Patents, Research, Researchers, Science, Technology, Triple-Helix, Universities, University

? Glenisson, P., Glänzel, W. and Persson, O. (2005), Combining full-text analysis and bibliometric indicators. A pilot study. *Scientometrics*, **63** (1), 163-180.

Full Text: [2005\Scientometrics63, 163.pdf](2005/Scientometrics63,%20163.pdf)

Abstract: In the present study full-text analysis and traditional bibliometric methods are combined to improve the efficiency of the individual methods in the mapping of science. The methodology is applied to map research papers from a special issue of Scientometrics. The outcomes substantiate that such hybrid methodology can be applied to both research evaluation and information retrieval. The subject classification given by the guest-editors of the special issue is used for validation purposes. Because of the limited number of papers underlying the study the paper is considered a pilot study that will be extended in a later study on the basis of a larger corpus.

Keywords: Word Analysis, Combined Cocitation, Science, Information, Impact, Websites, Database, Growth, Field, Tool

? Okubo, Y. (2005), Introduction to scientometrics: Application to research evaluation and science studies. *Scientometrics*, **63** (1), 181-183.

Full Text: [2005\Scientometrics63, 181.pdf](2005/Scientometrics63,%20181.pdf)

Keywords: Evaluation, Research, Research Evaluation, Scientometrics

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Full Text: [2005\Scientometrics63, 185.pdf](2005/Scientometrics63,%20185.pdf)

Keywords: Patent, Publication, Quantitative, Research, Science, Science and Technology, Statistics

? Ackermann, E. (2005), Bibliometrics of a controversial scientific literature: Polywater research, 1962-1974. *Scientometrics*, **63** (2), 189-208.

Full Text: [2005\Scientometrics63, 189.pdf](2005/Scientometrics63,%20189.pdf)

Abstract: This study examines the bibliometrics of the controversial scientific literature of Polywater research, focusing on publication types (books, journal publications, conference proceedings, and technical reports). Publication (P) frequency is used to measure publication ‘shape’ or pattern and output, citations per publication (CPP) for impact, author self-citations (SC) and uncited publications (UP) for their effect on P and CPP. Findings show an epidemic publication pattern, journal publications with the highest P, books with the highest CPP, and insignificant SC and UP. Comparisons to several non-controversial scientific literatures suggest that these findings may be common to other controversial scientific literatures.

Keywords: Anomalous Water, Basic Research, Bibliometrics, Citations, Field, Growth, Indicators, Journal, Netherlands, Publication, Publications, Research, Science, Self-Citation, Statistics

? Bailón-Moreno, R., Jurado-Alameda, E., Ruiz-Baños, R.R. and Courtial, J.P. (2005), Bibliometric laws: Empirical flaws of fit. *Scientometrics*, **63** (2), 209-229.

Full Text: [S\Scientometrics63, 209.pdf](S/Scientometrics63,%20209.pdf)

Abstract: The bibliometric laws of Zipf, Bradford, and Lotka, in their various mathematical expressions, frequently present difficulties in the fitting of empirical values. The empirical flaws of fit take place in the frequency of the words, in the productivity of the authors and the journals, as well as in econometric and demographic aspects. This indicates that the underlying fractal model should be revised, since, as shown, the inverse power equations (of the Zipf-Mandelbrot type) are not adequate, as they need to include exponential terms. These modifications not only affect Bibliometrics and Scientometrics, but also, for the generality of the fractal model, apply to Economy, Demography, and even Natural Sciences in general.

Keywords: Exact Formulation, Bradford’s Law, Lotka’s Law

? Bailón-Moreno, R., Jurado-Alameda, E., Ruiz-Baños, R.R. and Courtial, J.P. (2005), The unified scientometric model. Fractality and transfractality. *Scientometrics*, **63** (2), 231-257.

Full Text: [S\Scientometrics63, 231.pdf](S/Scientometrics63,%20231.pdf)

Abstract: A unified scientometric model has been developed on the basis of seven principles: the actor-network principle, the translation principle, the spatial principle, the quantativity principle, the composition principle, the centre-periphery or nucleation principle, and the unified principle of cumulative advantages. The paradigm of the fractal model has been expanded by introducing the concept of fractality index and transfractality. In this work, as the first demonstration of the power of the model proposed, all the bibliometric laws known and all their mathematical expressions are deduced, both the structural distributions (Zipf, Bradford and Lotka) as well as the Price’s Law of the exponential growth of science and Brookes’ and Avramescu’s Laws of ageing.

Keywords: Scientific Literature, Exact Formulation, Bradford’s Law, Lotka’s Law, Obsolescence, Growth, Dynamics, Translation, Cocitations, Networks

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Full Text: [2005\Scientometrics63, 259.pdf](2005/Scientometrics63,%20259.pdf)

Abstract: By the information system of CoPalRed&COPY, and with the treatment of 63,543 bibliographical references of scientific articles, the field of surfactants has been analysed in the light of the Unified Scientometric Model. It was found that the distributions of actors (countries, centres, and research laboratories, journals, researchers, key words of documents) fit Zif’s Unified Law better than the Zipf-Mandelbrot Law. The model showed an especially good fit for relational indicators such as density and centrality. Using the Unified Bradford Law, the three zones fit were: core, straight fraction, and Groos droop. The fractality index was used to verify that Science can present fractal as well as transfractal structures. In conclusion, the Unified Scientometric Model is, for its flexibility and its integrating capacity, an appropriate model for representing Science, joining non-relational with relational Scientometrics under the same paradigm.

Keywords: Co-Word Analysis, Dynamics, Journals, Research, Scientific Networks

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Full Text: [2005\Scientometrics63, 277.pdf](2005/Scientometrics63,%20277.pdf)

Abstract: We study new and existing data sets which show that growth rates of sources usually are different from growth rates of items. Examples: references in publications grow with a rate that is different (usually higher) from the growth rate of the publications themselves; article growth rates are different from journal growth rates and so on. In this paper we interpret this phenomenon of “disproportionate growth”; in terms of Naranan’s growth model and in terms of the self-similar fractal dimension of such an information system, which follows from Naranan’s growth model. The main part of the paper is devoted to explain disproportionate growth. We show that the “simple” 2-dimensional informetrics models of source-item relations are not able to explain this but we also show that linear 3-dimensional informetrics (i.e. adding a new source set) is capable to model disproportionate growth. Formulae of such different growth rates are presented using Lotkaian informetrics and new and existing data sets are presented and interpreted in terms of the used linear 3-dimensional model.

Keywords: Fractal Dimension, Growth, Information, Informetrics, Journal, Model, Publications

? Bornmann, L. and Daniel, H.D. (2005), Selection of research fellowship recipients by committee peer review. Reliability, fairness and predictive validity of Board of Trustees’ decisions. *Scientometrics*, **63** (2), 297-320.

Full Text: [2005\Scientometrics63, 297.pdf](2005/Scientometrics63,%20297.pdf)

Abstract: In science, peer review is the best-established method of assessing manuscripts for publication and applications for research fellowships and grants. However, the fairness of peer review, its reliability and whether it achieves its aim to select the best science and scientists has often been questioned. The paper presents the first comprehensive study on committee peer review for the selection of doctoral (Ph.D.) and post-doctoral research fellowship recipients. We analysed the selection procedure followed by the Boehringer Ingelheim Fonds (B.I.F.), a foundation for the promotion of basic research in biomedicine, with regard to the reliability, fairness and predictive validity of the procedure - the three quality criteria for professional evaluations. We analysed a total of 2,697 applications, 1,954 for doctoral and 743 for post-doctoral fellowships. In 76% of the cases, the fellowship award decision was characterized by agreement between reviewers. Similar figures for reliability have been reported for the grant selection procedures of other major funding agencies. With regard to fairness, we analysed whether potential sources of bias, i.e., gender, nationality, major field of study and institutional affiliation, could have influenced decisions made by the B.I.F. Board of Trustees. For post-doctoral fellowship applications, no statistically significant influence of any of these variables could be observed. For doctoral fellowship applications, we found evidence of an institutional, major field of study and gender bias, but not of a nationality bias. The most important aspect of our study was to investigate the predictive validity of the procedure, i.e., whether the foundation achieves its aim to select as fellowship recipients the best junior scientists. Our bibliometric analysis showed that this is indeed the case and that the selection procedure is thus highly valid: research articles by B.I.F. fellows are cited considerably more often than the ‘average’ paper (average citation rate) published in the journal sets corresponding to the fields ‘Multidisciplinary’, ‘Molecular Biology & Genetics’, and ‘Biology & Biochemistry’ in Essential Science Indicators (ESI) from the Institute for Scientific Information (ISI, Philadelphia, Pennsylvania, USA). Most of the fellows publish within these fields.

Keywords: Grant Proposals, Stands Today, Science, Bias, Manuscript, Journals, Quality, Attributes, Articles, Ratings

? Kim, M.J. (2005), Korean science and international collaboration, 1995-2000. *Scientometrics*, **63** (2), 321-339.

Full Text: [S\Scientometrics63, 321.pdf](S/Scientometrics63,%20321.pdf)

Abstract: This paper investigates Korean scientific output, focusing on international collaboration patterns, through an analysis of journal publications. For the study, 44,534 publications, published by researchers affiliated with Korean institutions and indexed by SCI during the six years 1995-2000, were considered. The study period was divided into two periods to compare the international collaboration for three years 1995-1997 and 1998-2000. The results show a clear decrease in Korea’s international collaboration level between the study periods even though the number of researchers as well as the total R&D expenditure decreased considerably after Korea’s economic change. The decrease of international collaboration in Korean science was inversely associated with different determinants such as scientific size as well as national scientific infrastructure. This decreasing trend of international collaboration in Korean science was largely caused by discipline-to-discipline variations in coverage of the SCI database. Among the top-ten collaborating countries, only the Chinese and the Canadian share of collaborative publications with Korea increased between the two periods under consideration.

Keywords: Bibliometric Analysis, Co-Authorship, Patterns, Publications, Cooperation, Physics

? Lewison, G. and Hartley, J. (2005), What’s in a title? Numbers of words and the presence of colons. *Scientometrics*, **63** (2), 341-356.

Full Text: [2005\Scientometrics63, 341.pdf](2005/Scientometrics63,%20341.pdf)

Abstract: Much has been written about titles in scientific journal articles but little research has been carried out. We aimed to assess in two studies how factors like the length of a title and its structure might vary in different scientific fields, and whether or not these features have changed over time. Statistical analyses were made of 216,500 UK papers from science journals, and of 133,200 international oncology papers. Factors examined included title length, the use of colons in the titles, and the number of authors. All of these factors increased over time for both sets of papers, although there were some disciplinary differences in the findings. In both studies, titles with colons occurred more frequently with single than with multiple authors except when the numbers of co-authors were large. Certain features of titles can be related to different disciplines, different journals, the numbers of authors and their nationalities.

Keywords: Articles, Authors, Differences, Factors, Impact, Journal, Journals, Length, Oncology, Papers, Research, Scholarship, Science, Scientific Journal, Titular Colonicity, UK

? van Leeuwen, T.N. and Moed, H.F. (2005), Characteristics of Journal Impact Factors: The effects of uncitedness and citation distribution on the understanding of journal impact factors. *Scientometrics*, **63** (2), 357-371.

Full Text: [2005\Scientometrics63, 357.pdf](file:///H:\Bibliometric%20References\2005\Scientometrics63,%20357.pdf)

Abstract: In this study, journal impact factors play a central role. In addition to this important bibliometric indicator, which evolves around the average impact of a journal in a two-year timeframe, related aspects of journal impact measurement are studied. Aspects like the output volume, the percentage of publications not cited, and the citation frequency distribution within a set timeframe are researched, and put in perspective with the ‘classical’ journal Impact Factor.

In this study it is shown that these aspects of journal impact measurement play a significant role, and are strongly inter-related. Especially the separation between journals on the basis of the differences in output volume seems to be relevant, as can be concluded from the different results in the analysis of journal impact factors, the degree of uncitedness, and the share of a journal its contents above or below the impact factor value.

Keywords: Medical Journals, Institute, Science, Indicators, Criterion, Quality

? Zitt, M., Ramanana-Rahary, S. and Bassecoulard, E. (2005), Relativity of citation performance and excellence measures: From cross-field to cross-scale effects of field-normalisation. *Scientometrics*, **63** (2), 373-401.

Full Text: [S\Scientometrics63, 373.pdf](S/Scientometrics63,%20373.pdf)

Abstract: As citation practices strongly depend on fields, field normalisation is recognised as necessary for fair comparison of figures in bibliometrics and evaluation studies. However fields may be defined at various levels, from small research areas to broad academic disciplines, and thus normalisation values are expected to vary. The aim of this project was to test the stability of citation ratings of articles as the level of observation - hence the basis of normalisation - changes. A conventional classification of science based on ISI subject categories and their aggregates at various scales was used, namely at five levels: all science, large academic discipline, sub-discipline, speciality and journal. Among various normalisation methods, we selected a simple ranking method (quantiles), based on the citation score of the article in each particular aggregate (journal, speciality, etc.) it belonged to at each level. The study was conducted on articles in the full SCI range, for publication year 1998 with a four-year citation window. Stability is measured in three ways: overall comparison of article rankings, individual trajectory of articles, survival of the top-cited class across levels. Overall rank correlations on the observed empirical structure are benchmarked against two fictitious sets that keep the same embedded structure of articles but reassign citation scores either in a totally ordered or in a totally random distribution. These sets act respectively as a ‘worst case’ and ‘best case’ for the stability of citation ratings. The results show that: (a) the average citation rankings of articles substantially change with the level of observation (b) observation at the journal level is very particular, and the results differ greatly in all test circumstances from all the other levels of observation (c) the lack of cross-scale stability is confirmed when looking at the distribution of individual trajectories of articles across the levels, (d) when considering the top-cited fractions, a standard measure of excellence, it is found that the contents of the ‘top-cited’ set is completely dependent on the level of observation. The instability of impact measures should not be interpreted in terms of lack of robustness but rather as the co-existence of various perspectives each having their own form of legitimacy. A follow-up study will focus on the micro levels of observation and will be based on a structure built around bibliometric groupings rather than conventional groupings based on ISI subject categories.

Keywords: Impact-Factors, Scientific Journals, Indicators, Science, Distributions, Publication, Quality, System

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Full Text: [2005\Scientometrics63, 403.pdf](2005/Scientometrics63,%20403.pdf)

Abstract: The definitions of Experimental Development and Applied Research currently suggested by OECD bring about inconsistent R&D data. Here, coherent definitions, based on the criterion of generality, are proposed.

Keywords: Definitions, Research

? Braun, T. (2005), Strange referencing and some remarks. *Scientometrics*, **63** (2), 407-410.

Full Text: [2005\Scientometrics63, 407.pdf](2005/Scientometrics63,%20407.pdf)

Keywords: Nations

? Leydesdorff, L. (2005), The scientific impact of China. *Scientometrics*, **63** (2), 411-412

Full Text: [2005\Scientometrics63, 411.pdf](2005/Scientometrics63,%20411.pdf)

Keywords: China, Impact, Scientific Impact

? Trimble, V. (2005), Productivity and impact analysis: Rediscovering the obvious. *Scientometrics*, **63** (2), 413-416

Full Text: [2005\Scientometrics63, 413.pdf](2005/Scientometrics63,%20413.pdf)

Keywords: Analysis, Impact, Impact Analysis, Productivity

? Vinkler, P. (2005), Science indicators, economic development and the wealth of nations. *Scientometrics*, **63** (2), 417-419.

Full Text: [2005\Scientometrics63, 417.pdf](2005/Scientometrics63,%20417.pdf)

Keywords: Development, Impact, Science, Science Indicators

? McAleer, M. and Slottje, D. (2005), A new measure of innovation: The patent success ratio. *Scientometrics*, **63** (3), 421-429.

Full Text: [2005\Scientometrics63, 421.pdf](2005/Scientometrics63,%20421.pdf)

Abstract: Patents have become increasingly important, especially over the past two decades. As patent office procedures have adapted to remain abreast of changing economic and scientific circumstances, it has also become increasingly important to define and analyse innovation more precisely. This paper introduces a simple new measure of innovation, the patent success ratio (PSR), or the ratio of successful patent applications to total patent applications. It has been argued in the extensive literature on innovation and technology policy that patents can serve as an accurate proxy for innovative activity or innovation. This paper suggests that PSR is a more accurate measure of how innovative activity has changed over time. A sensitivity analysis is conducted to assess the usefulness of the new PSR measure of innovation using annual US data for the period 1915-2001.

Keywords: Analysis, Innovation, Literature, Patent, Patents, Policy, Ratio, Sensitivity, Success, US

? Rousseau, R. (2005), Median and percentile impact factors: A set of new indicators. *Scientometrics*, **63** (3), 431-441.

Full Text: [2005\Scientometrics63, 431.pdf](2005/Scientometrics63,%20431.pdf)

Abstract: In a recent article Sombatsompop et al. (2004) proposed a new way of calculating a synchronous journal impact factor. Their proposal seems quite interesting and will be discussed in this note. Their index will be referred as the Median Impact Factor (MIF). I explain every step in detail so that readers with little mathematical background can understand and apply the procedure. Illustrations of the procedure are presented. Some attention is given to the estimation of the median cited age in case it is larger than ten year. I think the idea introduced by Sombatsompop, Markpin and Premkamolnetr has a great theoretical value as they are - to the best of my knowledge - the first ones to consider impact factors not using years as a basic ingredient, but an element of the actual form of the citation curve. The MIF is further generalized to the notion of a percentile impact factor.

Keywords: Attention, Citation, Citations, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journal Impact Factor, Knowledge, Number, Science

? Bar-Ilan, J. and Echermane, A. (2005), The anthrax scare and the Web: A content analysis of Web pages linking to resources on anthrax. *Scientometrics*, **63** (3), 443-462.

Full Text: [2005\Scientometrics63, 443.pdf](2005/Scientometrics63,%20443.pdf)

Abstract: The purpose of this study was to develop a method for characterizing the page and linking patterns related to dramatic events on the Web. As a specific case, we characterized Web pages linking to the set of pages on anthrax indexed by the Yahoo directory (generally acknowledged as a high quality directory). The sample of Web pages was collected shortly after anthrax became a matter of widespread concern (November 2001). The findings show that at that time the “typical” source page was either a news item or a page with a list of links. Most of the examined links were not navigational but linked to the target page in order to provide additional content. Many Web sites added hyperlinks to pages providing presumably authoritative and high quality information on anthrax rather than supplying the information themselves. The results show that Web authors link extensively to presumably “high quality” pages. The methods presented here can be utilized in order to characterize pages and linking patterns of Web pages linking to a set of predefined pages, and the findings of this specific study can serve as a basis for comparison.

Keywords: Analysis, Authors, Communication, Consumer Health Information, Content Analysis, Eating Disorders, Information, Internet, Quality, Search Engines, World-Wide-Web

? Altvater-Mackensen, N., Balicki, G., Bestakowa, L., Bocatius, B., Braun, J., Brehmer, L., Brune, V., Eigemeier, K., Erdem, F., Fritscher, R., Jacobs, A., Klingsporn, B., Kosinski, M., Kuntze, J., Lee, J.R., Osterhage, A., Probost, M., Risch, T., Schmitt, T., Stock, W.G., Sturm, A., Weller, K. and Werner, K. (2005), Science and technology in the region: The output of regional science and technology, its strengths and its leading institutions. *Scientometrics*, **63** (3), 463-529.

Full Text: [2005\Scientometrics63, 463.pdf](2005/Scientometrics63,%20463.pdf)

Abstract: We operationalize scientific output in a region by means of the number of articles (as in the SciSearch database) per year and technology output by means of the number of patent applications (as in the database of the European Patent Office) per priority year. All informetric analyses were done using the DIALOG online-system. The main research questions are the following: Which scientific and technological fields or topics are most influent within a region and which institutions or companies are mainly publishing articles or holding patents? Do the distributions of regional science and technology fields and of publishing institutions follow the well-known informetric function? Are there - as it is expected - only few fields and few institutions which dominate the region? Is there a connection between the economic power of a region and the regional publication and patent output? Examples studied in detail are seven German regions: Aachen, Dusseldorf, Hamburg, Koln (Cologne), Leipzig - Halle - Dessau, Munchen (Munich), and Stuttgart. Three different indicators were used, science and technology attraction of a region (number of scientific articles and patents), science and technology intensity (articles and patents per 1,000 inhabitants), and science and technology density (articles and patents per 1 billion EURO gross value added). Top region concerning both attraction and intensity is Munich, concerning density it is Aachen.

Keywords: Centers, Indicators, Innovation, Knowledge, Patent, Power, Priority, Publication, Publishing, Research, Science, Science and Technology, Scientific Output, Specialization, Spillovers, Topics, Value-Added

? Yalpani, M., Heydari, A. and Mehrdad, M. (2005), Application of scientometric methods to chemical research in Iran: Reflections on Iran’s current science policy. *Scientometrics*, **63** (3), 531-547.

Full Text: [2005\Scientometrics63, 531.pdf](2005/Scientometrics63,%20531.pdf)

Abstract: Following a brief historical account of the initial difficulties of introducing modern sciences, especially the Western art of independent scientific inquiry, into Iran, using data obtained from the ISI (http://access.isiproducts.com/trials) an attempt is made to analyze the apparent present successes of Iranian scientists on the international science market. Using the corresponding ISI data of the publications (1990-2003) of 24 selected young chemistry Ph.D. graduates and present faculty members at various internal academia, a quantitative and qualitative assessment (www.geocities.com/iipopescu) of their achievements has been attempted and the results related to the strengths and weaknesses of the present science policy of the country.

Keywords: Faculty, ISI, Publications, Research, Sciences, Scientometric

? van Raan, A.F.J. (2005), Reference-based publication networks with episodic memories. *Scientometrics*, **63** (3), 549-566.

Full Text: [2005\Scientometrics63, 549.pdf](2005/Scientometrics63,%20549.pdf)

Abstract: In this paper we report first results of our study on network characteristics of a reference-based, bibliographically coupled (BC) publication network structure. We find that this network of clustered publications shows different statistical properties depending on the age of the references used for building the network. A remarkable finding is that only the network based on all references within publications is characterized by a degree distribution with a power-law dependence. This structure, which is typical for scale-free networks, disappears when selecting references of a specific age for the clustering process. Changing the publication network as a function of reference age, allows “tuning through the episodic memory’ of the nodes of the network. We find that the older the references, the more the network tends to change its structure towards a more exponential degree distribution.

Keywords: Distributions, Evolution, Evolving Networks, Law, Memory, Network, Process, Publication, Publications, Science, Scientific Papers, Small-World Networks, Statistical

Adams, J. (2005), Early citation counts correlate with accumulated impact. *Scientometrics*, **63** (3), 567-581.

Full Text: [2005\Scientometrics63, 567.pdf](2005/Scientometrics63,%20567.pdf)

Abstract: The present paper addresses the objective of developing forward indicators of research performance using bibliometric information on the UK science base. Most research indicators rely primarily on historical time series relating to inputs to, activity within and outputs from the research system. Policy makers wish to be able to monitor changing research profiles in a more timely fashion, the better to determine where new investment is having the greatest effect. Initial (e.g. 12 months from publication) citation counts might be useful as a forward indicator of the long-term (e.g. 10 years from publication) quality of research publications, but - although there is literature on citation-time functions - no study to evaluate this specifically has been carried out by Thomson ISI or any other analysts. Here, I describe the outcomes of a preliminary study to explore these citation relationships, drawing on the UK National Citation Report held by Evidence Ltd under licence from Thomson ISI for OST policy use. Annual citation counts typically peak at around the third year after publication. I show that there is a statistically highly significant correlation between initial (years 1-2) and later (years 3-10) citations in six research categories across the life and physical sciences. The relationship holds over a wide range of initial citation counts. Papers that attract more than a definable but field dependent threshold of citations in the initial period after publication are usually among the top 1% (the most highly cited papers) for their field and year. Some papers may take off slowly but can later join the high impact group. It is important to recognise that the statistical relationship is applicable to groups of publications. The citation profiles of individual articles may be quite different. Nonetheless, it seems reasonable to conclude that leading indicators of research excellence could be developed. This initial study should now be extended across a wider range fields to test the initial outcomes: earlier papers suggest the model holds in economics. Additional statistical tests should be applied to explore and model the relationship between initial, later and total citation counts and thus to create a general tool for policy application.

Keywords: Activity, Base, Bibliometric, Citations, Correlation, Economics, General, Group, Groups, Historical, Impact, Indicator, Indicators, Information, Initial Study, Inputs, ISI, Life, Long-Term, Model, Outcomes, Paper, Performance, Physical, Policy, Profiles, Publication, Publications, Quality, Range, Reception, Research, Research Performance, Science, Sciences, Statistical Tests, Test, Tests, Threshold, Time-Series, UK

? Patra, S.K. and Chand, P. (2005), Biotechnology research profile of India. *Scientometrics*, **63** (3), 583-597.

Full Text: [2005\Scientometrics63, 583.pdf](2005/Scientometrics63,%20583.pdf)

Abstract: The study explores the chronological growth of Indian Biotechnology. Applicability of Lotka’s law has been examined for the authorship pattern. Productivity of authors is analyzed and a list of 35 authors publishing more than 10 publications is given. Bradford’s law of scattering is used to identify the core journals which cover most of the research and development output of Indian Biotechnology. The study also shows the active authors, institutions and statewise distributions of Indian Biotechnology research output.

Keywords: Authors, Authorship, Authorship Pattern, Biotechnology, Development, Growth, India, Journals, Law, Lotka’s Law, Productivity, Profile, Publications, Publishing, Research, Research and Development, Research Output, Research Profile, Science

? Leta, J., Pereira, J.C.R. and Chaimovich, H. (2005), The Life Sciences - the relative contribution of the University of Sao Paulo to the highest impact factor journals and to those with the largest number of articles, 1980 to 1999. *Scientometrics*, **63** (3), 599-616.

Full Text: [2005\Scientometrics63, 599.pdf](2005/Scientometrics63,%20599.pdf)

Abstract: The contribution of Brazil to the database of the Institute for Scientific Information, ISI, has increased remarkably during the last years. Among the Brazilian research institutions, the publications of the University of Sao Paulo (USP) have been around 30% of the country’s total publication within the ISI database. A similar share was found for USP’s publications published in the 1980-1999 period and classified in the Life Sciences. This was observed in publications from both the highest impact factor journals and from those with the largest number of articles. We have found that the present share of USP’s publications in some of the fields of the Life Sciences was much less than 30%, suggesting a gradual decentralization of the scientific activity in Brazil. The data point out that this set of USP’s publications were concentrated in traditional and basic fields of biological research, where the focus is mainly oriented by international trends. The data suggest that USP’s researchers have not been much devoted to some of the fields where research is oriented toward national issues.

Keywords: Brazil, Contribution, Impact, Impact Factor, ISI, ISI Database, Journals, Publication, Publications, Research, Research Institutions, Researchers, Sciences, Scientific Information, Traditional, Trends, University

? Leydesdorff, L. and Zhou, P. (2005), Are the contributions of China and Korea upsetting the world system of science? *Scientometrics*, **63** (3), 617-630.

Full Text: [2005\Scientometrics63, 617.pdf](2005/Scientometrics63,%20617.pdf)

Abstract: Institutions and their aggregates are not the right units of analysis for developing a science policy with cognitive goals in view. Institutions, however, can be compared in terms of their performance with reference to their previous stages. KING’s (2004) ‘The scientific impact of nations’ has provided the data for this comparison. Evaluation of the data from this perspective along the time axis leads to completely different and hitherto overlooked conclusions: a new dynamic can be revealed which points to a group of emerging nations. These nations do not increase their contributions marginally, but their national science systems grow endogenously. In addition to publications, their citation rates keep pace with the exponential growth patterns, albeit with a delay. The center of gravity of the world system of science may be changing accordingly.

Keywords: Analysis, China, Citation, Evaluation, Growth, Impact, Institutions, Nations, Performance, Points, Policy, Publication, Publications, Science, Science Policy, Scientific Impact

? Ahmed, T., Johnson, B., Oppenheim, C. and Peck, C. (2005), Untitled. *Scientometrics*, **63** (3), 631.

Full Text: [2005\Scientometrics63, 631.pdf](2005/Scientometrics63,%20631.pdf)

Keywords: Crick, Watson

? Glänzel, W., Thijs, B. and Schlemmer, B. (2005), A bibliometric approach to the role of author self-citations in scientific communication (vol 59, pg 63, 2004). *Scientometrics*, **63** (3), 633.

Full Text: [S\Scientometrics63, 633.pdf](S/Scientometrics63,%20633.pdf)

? Benito, J.G., Montesinos, M.D.H., Ferre, G.G. and Torrente, M.M. (2005), A bibliometric study of differential item functioning. *Scientometrics*, **64** (1), 3-16.

Full Text: [2005\Scientometric64, 3.pdf](2005/Scientometric64,%203.pdf)

Abstract: This study presents a bibliometric analysis of scientific output in the area of Differential Item Functioning (DIF), the aim being to offer an overview of research activity in this field and characterise its most important aspects and their evolution over the last quarter of the 20th century, thus providing data regarding the basis on which this activity is being developed at the beginning of the 21st century. The analysis make, use of the Web of Science database, the search being restricted to articles published between 1975 and 2000 and which contain the terms ‘differential item functioning’, ‘DIF or ‘item bias’. The various analyses focus on the presentation of publication frequencies and percentages, as well as on the application of Bradford’s law of scattering and Lotka’s law.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Study, Publication, Research, Web of Science

? Tsay, M.Y. and Chen, Y.L. (2005), Journals of general & internal medicine and surgery: An analysis and comparison of citation. *Scientometrics*, **64** (1), 17-30.

Full Text: [2005\Scientometrics64, 17.pdf](2005/Scientometrics64,%2017.pdf)

Abstract: The purpose of this study is to analyze and compare journal citation data, from Journal Citation Reports on the Web 2000, of general and internal medicine and Surgery. The source items and five kinds of citation data, i.e. citation counts, impact factor, immediacy index, citing half-life and cited half-life are examined and the correlation between each of the fifteen pairs of citation data is determined based on the Pearson correlation tests. The Fisher’s Z-transform was employed to test the significant difference between the Pearson correlation coefficient for each pair of citation data of these two subject areas. The following results of this work reveal: the frequently published journals are cited more frequently and also with high impact factor and immediacy index, in addition, they are usually accompanied with short citing half-life (i.e., usually cite current literature). The impact factor and immediacy index has significant correlation with citation Counts. A significant correlation also exists between impact factor and immediacy index. However there is no correlation between cited half-life and other citation data, except citing half-life. For journals of general and internal medicine and surgical medicine, there are no significant difference of the Pearson correlation coefficient for the following pair of citation data: source items and citation counts, source items and impact factor, source items and citing half-life, citation counts and citing half-life, impact factor and citing half-life, immediacy index and citing half-life, and cited half-life and citing half-life.

Keywords: Analysis, Citation, Citation Counts, Correlation Coefficient, Impact, Impact Factor, Journal, Journal Citation Reports, Journals, Literature, Medicine, Obsolescence, Reports, Surgery, Surgical

? Chen, D.Z., Chang, H.W., Huang, M.H. and Fu, F.C. (2005), Core technologies and key industries in Taiwan from 1978 to 2002: A perspective from patent analysis. *Scientometrics*, **64** (1), 31-53.

Full Text: [2005\Scientometrics64, 31.pdf](2005/Scientometrics64,%2031.pdf)

Abstract: This paper uses United States patent classification analysis to study the development of core technologies and key industries in Taiwan over the last 25 years, from 1978 to 2002. After counting the number of Taiwan-held United States granted Utility patents, the authors divide the years into three phases: from 1978 to 1994, with less than 500 patents each year; from 1995 to 1999, with 500-2,500 patents each year; from 2000 to 2002, with annual patents greater than 2,500. The results show that for both Taiwan’s core technologies and key industries, there was a great diversity at the first phase, while a mainstream forms and matures at the second and the third phases. However, industrial development at the third phase was more concentrated and focused than previous ones. Overall, Taiwan has clearly moved from a manufacturing-based economy to an innovation-based one, with its focus on high-tech industries during the previous 25 years.

Keywords: Analysis, Authors, Development, Germany, Industries, Patent, Patent Analysis, Taiwan, United States

? Lima, M., Liberman, S. and Russell, J.M. (2005), Scientific group cohesiveness at the National University of Mexico. *Scientometrics*, **64** (1), 55-66.

Full Text: [2005\Scientometrics64, 55.pdf](2005/Scientometrics64,%2055.pdf)

Abstract: We present the results on the relationship between the bonding number (the number of links among the authors of an article) and a measure of group cohesiveness on a Likert-type scale in three research areas, Biotechnology, Mathematics and Physics, at the National University of Mexico (UNAM). We found a difference between disciplines with regard to group size, and although there is little difference between disciplines in cohesiveness, results suggest that there is a direct relationship between the level of cohesiveness and the bonding number in Physics and Biotechnology, but not in Mathematics where the groups are much smaller.

Keywords: Authors, Biotechnology, Bonding, Cohesion, Mathematics, Mexico, Physics, Productivity, Research, Size, Teams, University

? Moon, H.S. and Lee, J.D. (2005), A fuzzy set theory approach to national composite S&T indices. *Scientometrics*, **64** (1), 67-83.

Full Text: [2005\Scientometrics64, 67.pdf](2005/Scientometrics64,%2067.pdf)

Abstract: Composite science and technology (S&T) indices are essential to overall understanding and evaluation of national S&T status, and to formulation of S&T policy. However, only a few studies on making these indices have been conducted so far since a number of complications and uncertainties are involved in the work. Therefore, this study proposes a new approach to employ fuzzy set theory and to make composite S&T indices, and applies it. The approach appears to Successfully integrate various S&T indicators into three indices: R&D input, R&D output, and economic Output. We also compare Korea’s S&T indices with those of five developed countries (France, Germany, Japan, the United Kingdom, and the United States) to obtain some implications of the results for Korea’s S&T.

Keywords: Complications, Composite, Decision-Making, Evaluation, France, Germany, Indicators, Japan, Numbers, Policy, Science, Science and Technology, Theory, United Kingdom, United States

? Gauffriau, M. and Larsen, P.O. (2005), Counting methods are decisive for rankings based on publication and citation studies. *Scientometrics*, **64** (1), 85-93.

Full Text: [2005\Scientometrics64, 85.pdf](2005/Scientometrics64,%2085.pdf)

Abstract: For all rankings Of Countries research output based on number of publications or citations compared with population, GDP, R&D and public R&D expenses, and other national characteristics the counting method is decisive. Total counting (full credit to a country when at least one of the authors is from this country) and Fractional Counting (a country receives a fraction of full credit for a publication equal to the fraction of authors from this country) Of publications give widely different results. Counting methods must be stated, rankings based on different counting methods cannot be compared, and Fractional Counting is to be preferred.

Keywords: Countries, Nations

? Podlubny, I. (2005), Comparison of scientific impact expressed by the number of citations in different fields of science. *Scientometrics*, **64** (1), 95-99.

Full Text: [2005\Scientometric64, 95.pdf](2005/Scientometric64,%2095.pdf)

Abstract: Citation distributions for 1992, 1994, 1996, 1997, 1999, and 2001, which were published in the 2004 report of the National Science Foundation, USA, are analyzed. It is shown that the ratio of the total number of citations of any two broad fields of science remains close to constant over the analyzed years. Based on this observation, normalization of total numbers of citations with respect to the number of citations in mathematics is suggested as a tool for comparing scientific impact expressed by the number of citations in different fields of science.

Keywords: Citation, Citation Distributions, Citations, Fields of Science, Impact, Observation, Ratio, Science, Scientific Impact, USA

? Liu, N.C., Cheng, Y. and Liu, L. (2005), Academic ranking of world universities using scientometrics - A comment to the ‘Fatal Attraction’. *Scientometrics*, **64** (1), 101-109.

Full Text: [2005\Scientometric64, 101.pdf](2005/Scientometric64,%20101.pdf)

Abstract: The Institute of Higher Education, Shanghai Jiao Tong University published on the web the Academic Ranking of World Universities and attracted wide attentions worldwide. 60% of their criteria are based on the databases using scientometrics. They were aware of all possible technical problems, have gone through ‘clean up’ processes and made necessary corrections. Highly cited researchers and articles published in nature and Science were identified one by one and attributed to the correct institutions. They are confident that errors including human ones in their data are less than two percent. They will continue their ranking efforts, improve their ranking methodologies and provide more choices on the ranking lists.

Keywords: Scientometrics, Universities, Web

? van Raan, A.F.J. (2005), Academic ranking of world universities using scientometrics - A comment to the ‘Fatal Attraction’ - Reply. *Scientometrics*, **64** (1), 111-112.

Full Text: [2005\Scientometrics64, 111.pdf](2005/Scientometrics64,%20111.pdf)

Keywords: Scientometrics, Universities

? Braun, T. and Diospatonyi, I. (2005), The journal gatekeepers of major publishing houses of core science journals. *Scientometrics*, **64** (2), 113-120

Full Text: [2005\Scientometrics64, 113.pdf](2005/Scientometrics64,%20113.pdf)

Keywords: Journal, Journals, Publishing, Science

? Kumar, S. and Garg, K.C. (2005), Scientometrics of computer science research in India and China. *Scientometrics*, **64** (2), 121-132.

Full Text: [2005\Scientometrics64, 121.pdf](2005/Scientometrics64,%20121.pdf)

Abstract: An analysis of 2058 papers published by Chinese authors and 2678 papers published by Indian authors in the field of computer science during 1971-2000 indicates that India’s output is significantly higher than the Chinese output. However, China is catching up fast. Chinese researchers prefer to publish their research results in domestic journals, while Indian researchers prefer to publish their research results in journals published in the advanced countries of the West. Also the share of papers in journals covered by SCI for India was higher than from China. However, no significant difference has been observed in the impact of the research output of the two countries as seen by different impact indicators. Team research is more common in India as compared to China.

Keywords: Laser Research, Decline, Impact

? Lozano, S. and Salmeron, J.L. (2005), Data envelopment analysis of OR/MS journals. *Scientometrics*, **64** (2), 133-150.

Full Text: [2005\Scientometrics64, 133.pdf](2005/Scientometrics64,%20133.pdf)

Abstract: This paper presents the results of a Data Envelopment Analysis of Operations Research/ Management Science journals on two questions: the duration of the refereeing/publication process and the relation between the length of the articles published and their impact. The second question uses data publicly available through the ISI Journal Citation Reports database and through the journals contents while for the first question data had to be gathered from the journal editors through an e-mail survey. The analysis gives cues about the amount each journal should aim to reduce their lead times, setting efficiency targets both on the average time from submission to first editorial decision and on the time from final editorial decision to publication. Similarly, for each journal, efficiency targets for the average article length are obtained. Our promoting of refereeing efficiency and paper length efficiency assumes that no loss of quality in the peer review process or in the knowledge transmission process needs to happen.

Keywords: Analysis, Citation, Cost, Data Envelopment Analysis, Econometrics, Email, Impact, ISI, Journal, Journal Citation Reports, Journal Editors, Journals, Knowledge, Lead, Management, Peer Review, Peer-Review, Process, Publication, Quality, Reports, Review, Science, Speed, Survey

? Li, X.M., Thelwall, M., Wilkinson, D. and Musgrove, P. (2005), National and international university departmental Web site interlinking. Part 1: Validation of departmental link analysis. *Scientometrics*, **64** (2), 151-185.

Full Text: [S\Scientometrics64, 151.pdf](S/Scientometrics64,%20151.pdf)

Abstract: The structural similarity between hyperlinks and citations has encouraged information scientists to apply bibliometric techniques to the Web. University links have been previously validated as a new data source through significant statistical correlations between link and research measures, together with identification of motivations for hyperlink creation at the university level. Many investigations have been conducted for university interlinking, but few for departments. University Web sites are large compared with departmental Web sites, and significant statistical results are more easily obtained. Nevertheless, universities are multidisciplinary by nature and disciplines may employ the Web differently, thus patterns identified at the university level may hide subject differences. This paper validates departmental interlinking, using Physics, Chemistry and Biology departments from Australia, Canada and the UK.

Keywords: Impact Factors, Academic-Institutions, Citation Analysis, Communication, Disciplinary, Information, Patterns, Inlinks

? Li, X.M., Thelwall, M., Wilkinson, D. and Musgrove, P. (2005), National and international university departmental Web site interlinking. Part 2: Link patterns. *Scientometrics*, **64** (2), 187-208.

Full Text: [2005\Scientometrics64, 187.pdf](2005/Scientometrics64,%20187.pdf)

Abstract: Although many link patterns have been identified at the university level, departmental interlinking has been relatively ignored. Universities are multidisciplinary by nature and various disciplines may employ the Web differently, thus patterns identified at the university level may hide subject differences. Departments are typically subject-oriented, and departmental interlinking may therefore illustrate interesting disciplinary linking patterns, perhaps relating to informal scholarly communication. The aim of this paper is to identify whether and how link patterns differ along country and disciplinary lines between similar disciplines and similar countries. Physics, Chemistry and Biology departments in Australia, Canada and the UK have been chosen. In order to get a holistic picture of departments Web use profiles and link patterns, five different perspectives are identified and compared for each set of departments. Differences in link patterns are identified along both national and disciplinary lines, and are found to reflect offline phenomena. Along national lines, a likely explanation for the difference is that countries with better research performances make more general use of the Web; and, with respect to international peer interlinking, countries that share more scholarly communication tend to interlink more with each other. Along disciplinary lines, it seems that departments from disciplines which are more willing to distribute their research outputs tend to make more general use of the Web, and also interlink more with their national and international peers.

Keywords: Canada, Chemistry, Co-Authorship, Communication, Differences, Impact Factor, Physics, Research, Scholarly Communication, UK, Universities, University, Webometrics

? van Dalen, H.P. and Henkens, K. (2005), Signals in science - On the importance of signaling in gaining attention in science. *Scientometrics*, **64** (2), 209-233.

Full Text: [2005\Scientometrics64, 209.pdf](2005/Scientometrics64,%20209.pdf)

Abstract: Which signals are important in gaining attention in science? For a group of 1,371 scientific articles published in 17 demography journals in the years 1990-1992 we track their influence and discern which signals are important in receiving citations. Three types of signals are examined: the author’s reputation (as producer of the idea), the journal (as the broker of the idea), and the state of uncitedness (as an indication of the assessment by the scientific community of an idea). The empirical analysis points out that, first, the reputation of journals plays an overriding role in gaining attention in science. Second, in contrast to common wisdom, the state of uncitedness does not affect the future probability of being cited. And third, the reputation of a journal may help to get late recognition (so-called sleeping beauties) as well as generate ‘flash-in-the-pans’: immediately noted articles but apparently not very influential in the long run.

Keywords: Analysis, Articles, Assessment, Attention, Citations, Demographers, Economics, Indication, Journal, Journals, Points, Science, Success

? Yu, G., Wang, X.H. and Yu, D.R. (2005), The influence of publication delays on impact factors. *Scientometrics*, **64** (2), 235-246.

Full Text: [2005\Scientometrics64, 235.pdf](2005/Scientometrics64,%20235.pdf)

Abstract: Based on the convolution formula of the disturbed aging distribution (EGGHE & ROUSSEAU, 2000) and the transfer function model of the publishing delay process, we establish the transfer function model of the disturbed citing process. Using the model, we make simulative investigations of disturbed citation distributions and impact factors according to different average publication delays. These simulative results show that the bigger increment the average publication delays in a scientific field, the larger shift backwards of the citation distribution curves and the more fall the impact factors of journals in the field. Based on some theoretical hypotheses, it is shown that there exists theoretically an approximate inverse linear relation between the field (or discipline) average publication delay and the journal impact factor.

Keywords: Aging, Citation, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journal Impact Factor, Journals, Model, Process, Publication, Publishing

? Burrell, Q.L. (2005), The use of the generalized Waring process in modelling informetric data. *Scientometrics*, **64** (3), 247-270.

Full Text: [2005\Scientometrics64, 247.pdf](2005/Scientometrics64,%20247.pdf)

Abstract: Although its use in informetrics dates back at least to 1987, data analysed in a recent paper by SHAN et al. (2004) has rekindled interest in the generalized Waring distribution (GWD). The purpose of this note is to show that for many purposes, the distribution is best motivated via a familiar informetric scenario of a population of “sources” producing “items” over time leading to a stochastic process from which the univariate, bivariate and multivariate forms of the GWD are natural consequences. Earlier work and possible future applications are highlighted. Many of the results are due to Irwin and Xekalaki while much of the material on the Waring process has been previously available in an unpublished research report by the author (Burrell, 1991).

Keywords: Accident Theory, Author, Informetrics, Interest, Markov, Modelling, Natural, Prediction, Process, Research

? Garcia, C.E. and Sanz-Menendez, L. (2005), Competition for funding as an indicator of research competitiveness. *Scientometrics*, **64** (3), 271-300.

Full Text: [2005\Scientometrics64, 271.pdf](2005/Scientometrics64,%20271.pdf)

Abstract: Research quality is the cornerstone of modern science, it is used in the understanding of reputational differences among scientific and academic institutions. Traditionally, scientific activity is measured by a set of indicators and well-established bibliometric techniques based on the number of academic papers published in top-ranked journals or on the number of citations of these papers. These indicators are usually critical in measuring differences in research performance, both at individual and at scientific institutional levels. In this paper, we introduce an alternative and complementary set of indicators based on the results of competition for research funding, that aims to enlarge the framework in which research performance has traditionally been measured. Theoretical support for this paper is found in the role that the search for funding plays in the researchers’ credibility cycle as well as in peer review, the basic instrument for the allocation of public R&D funds. Our method analyses the outcomes of the researchers’ struggle for funding, using data from research proposal applications and awards, as the unit of observation, and aggregating them by research institutions to rank them in relative scales of research competitiveness.

Keywords: Bibliometric Indicators, Excellence, Impact, Journals, Netherlands, Research Performance, Research Policy, Science Policy, Stands Today, University

? Marinova, D., McAleer, M. and Slottje, D. (2005), Antitrust environment and innovation. *Scientometrics*, **64** (3), 301-311.

Full Text: [2005\Scientometrics64, 301.pdf](2005/Scientometrics64,%20301.pdf)

Abstract: This paper examines the relationship between the antitrust environment and innovation in the US economy, where innovation is measured by patent activity. The hypothesis to be tested is whether antitrust enforcement activity, as measured by the number of civil filings of the US Department of Justice, has had a significant impact on the level of innovation in the US economy, after adjusting for other factors that have an impact on innovation, such as research and development expenditures and real economic growth. Impacts of civil antitrust case filings, criminal antitrust case filings and total US Department of Justice antitrust case filings on patent activity in the USA are estimated for the period 1953-2000. The empirical results show that civil case filings have a statistically significant impact on innovation.

? Cardona, M. and Marx, W. (2005), The disaster of the Nazi-power in science as reflected by some leading journals and scientists in physics. A bibliometric study. *Scientometrics*, **64** (3), 313-324.

Full Text: [2005\Scientometrics64, 313.pdf](2005/Scientometrics64,%20313.pdf)

Abstract: The dramatic consequences of the Nazi-power for science are described extensively in various articles and books. Recent progress in information systems allows a more quantitative reflection. Literature databases ranging back to the beginning of the 20th century, the ISI citation indexes ranging back to 1945 and sophisticated search systems are suitable tools for this purpose. In this study the overall break in the scientific productivity and that of selected physical journals are examined. An overview of the citation impact of some 50 leading physicists is given. The productivity before and after departure is analyzed and, in some cases, connected to biographical data.

? Muñoz-Muñoz, A.M. (2005), The scholarly transition of female academics at the University of Granada (1975-1990). *Scientometrics*, **64** (3), 325-350.

Full Text: [2005\Scientometrics64, 325.pdf](2005/Scientometrics64,%20325.pdf)

Abstract: An attempt is made to shed light on part of Granada University’s female academics’ past in what was a critical period in Spain’s history (1975-1982), referring of course to the political transition from dictatorship to democracy. The period studied is 1975-1990, in which an analysis is made of a section of the teaching staff, using part of the female staff as the sample due to their being the most socially affected during this period. Firstly, a study is carried out on the teaching staff, both male and female, to verify the staff situation at the university using the gender indicator. Secondly, the female teachers’ scholarly output is studied, due to the fact that areas of study are very varied, it has been considered appropriate to apply the study to monographs, scholarly publications articles and doctoral theses. Moreover, because the study intends to be as exhaustive as possible, various databases and catalogues have been consulted which collect the documental typology to be used in the analysis.

Keywords: Bibliometric Analysis, Countries, Indicators, ISI, Publications, Sci 1984-89, Sciences, Spanish Pharmacologists, Women Scientists

? Boyack, K.W., Klavans, R. and Börner, K. (2005), Mapping the backbone of science. *Scientometrics*, **64** (3), 351-374.

Full Text: [2005\Scientometrics64, 351.pdf](2005/Scientometrics64,%20351.pdf)

Abstract: This paper presents a new map representing the structure of all of science, based on journal articles, including both the natural and social sciences. Similar to cartographic maps of our world, the map of science provides a bird’s eye view of today’s scientific landscape. It can be used to visually identify major areas of science, their size, similarity, and interconnectedness. In order to be useful, the map needs to be accurate on a local and on a global scale. While our recent work has focused on the former aspect,1 this paper summarizes results on how to achieve structural accuracy. Eight alternative measures of journal similarity were applied to a data set of 7,121 journals covering over 1 million documents in the combined Science Citation and Social Science Citation Indexes. For each journal similarity measure we generated two-dimensional spatial layouts using the force-directed graph layout tool, VxOrd. Next, mutual information values were calculated for each graph at different clustering levels to give a measure of structural accuracy for each map. The best co-citation and inter-citation maps according to local and structural accuracy were selected and are presented and characterized. These two maps are compared to establish robustness. The inter-citation map is then used to examine linkages between disciplines. Biochemistry appears as the most interdisciplinary discipline in science.

? Bonitz, M. (2005), Ten years Matthew effect for countries. *Scientometrics*, **64** (3), 375-379.

Full Text: [2005\Scientometrics64, 375.pdf](2005/Scientometrics64,%20375.pdf)

Abstract: Actually the Matthew effect for countries (MEC) was discovered at Holy Eve 1994. Since then more than 30 papers of mine - many of them together with Andrea Scharnhorst and Eberhard Bruckner - appeared in journals or were read at conferences of international and national scientific societies. (1-6) It is not the task of this paper to present a bibliometric analysis of those paper’s impact, nor to give any detailed historical description of the surprising findings following the discovery. I’d rather try to unfold - from the heightened standpoint of our days - a new summary of the Matthew phenomenon, because I am convinced it will not lose fascination and importance in the years to come.

Keywords: Competition, Core Journals, Nations, Science

? Park, H.W., Hong, H.D. and Leydesdorff, L. (2005), A comparison of the knowledge-based innovation systems in the economies of South Korea and the Netherlands using Triple Helix indicators. *Scientometrics*, **65** (1), 3-27.

Full Text: [2005\Scientometrics65, 3.pdf](2005/Scientometrics65,%203.pdf)

Abstract: This paper elaborates on the Triple Helix model for measuring the emergence of a knowledge base of socio-economic systems. The ‘knowledge infrastructure’ is measured using multiple indicators: webometric, scientometric, and technometric. The paper employs this triangulation strategy to examine the current state of the innovation systems of South Korea and the Netherlands. These indicators are thereafter used for the evaluation of the systemness in configurations of university-industry-government relations. South Korea is becoming somewhat stronger than the Netherlands in terms of scientific and technological outputs and in terms of the knowledge-based dynamics, South Korea’s portfolio is more traditional than that of the Netherlands. For example, research and patenting in the biomedical sector is underdeveloped. In terms of the Internet-economy, the Netherlands seem oriented towards global trends more than South Korea, this may be due to the high component of services in the Dutch economy.

? Sternberg, R. and Litzenberger, T. (2005), The publication and citation output of German Faculties of Economics and Social Sciences - A comparison of faculties and disciplines based upon SSCI data. *Scientometrics*, **65** (1), 29-53.

Full Text: [2005\Scientometrics65, 29.pdf](2005/Scientometrics65,%2029.pdf)

Abstract: The purpose of this study is to quantify and compare the publication and citation output of the biggest faculties of economics and social sciences in Germany. Various publication and citation measures based upon Social Science Citation Index (SSCI) data are used to explore the comparative strengths and weaknesses of ten academic fields at the named faculties. To reflect the varying size of the fields and faculties, output measures as well as productivity measures are explicitly considered. From a bibliometric perspective empirical results demonstrate that various measures are necessary to adequately identify the comparative strengths and weaknesses of entire faculties and of selected disciplines within faculties.

? Gordon, A. (2005), Homeland security literature in relation to terrorism publications: The source and the response. *Scientometrics*, **65** (1), 55-65.

Full Text: [2005\Scientometrics65, 55.pdf](2005/Scientometrics65,%2055.pdf)

Abstract: The literature on Terrorism and National Security (NS), and Homeland Security (HS) presents two sides of a coin: one side demonstrates the problematic nature of terrorism and asks for solutions; the other side tries to find a response and solutions to the problem. It was expected that the NS literature would emanate from the same source material as the HS publications. Analysis of the literature of terrorism, homeland security, and national security on Science Citation Index (SCI) has shown that the material on terrorism and NS stems from the same scientific sources; that is, the Social Sciences. In contrast, the HS scientific literature originates in the exact sciences, engineering, and life and environmental sources. The three kinds of literature have grown remarkably in recent years; however, cross-section search strategy between terrorism and HS studies yields small retrieval sets. This means that few articles both present the problem and propose possible solutions. Currently, HS is on one side of the scholarly arena, and NS and terrorism literature on the other side; they advance mostly in lines parallel to each other, but as the researcher moves from observing the core scientific literature toward the more general material, this state of affairs changes. Another analysis of a multimedia database, WorldCatalog (which indexes mostly books, but also videos and computer materials, both scientific and popular) demonstrates a different trend; the same publications deal with both terrorism and HS counter-terrorism, and suggested solutions.

Keywords: Analysis, Citation, Computer, Environmental, Indexes, Literature, Publications, SCI, Science, Science Citation Index, Sciences, Scientific Literature, Social Sciences, Strategy, Terrorism, Trend

? Pinto, M., Berrocal, J.L.A., García, J.A.C., Marcial, V.F., Figuerola, C.G., Marco, J.G. Gómez, C.C. and Zazo, R.Á.F. (2005), Quality assessment of Spanish universities’ web sites focused on the European Research Area. *Scientometrics*, **65** (1), 67-93.

Full Text: [2005\Scientometrics65, 67.pdf](2005/Scientometrics65,%2067.pdf)

Abstract: This work has analyzed and evaluated the dissemination of research done at Spanish universities through the World Wide Web (WWW) in order to obtain a map of the visibility of the information available on this research and to propose measures for improving the quality of this diffusion, all within the social and institutional context of the European Area for Higher Education. The methodology applied in the study has used both qualitative and quantitative research methods to obtain some quality indicators on the dissemination of university research. The object of study consists of a sample of 19 Spanish universities, chosen according to their representativeness by Autonomous Community and their administrative and scientific weight. The process of defining indicators, both qualitative and quantitative, as well as the collection and analysis of data, are explained. The results give us a detailed panorama of the state of the art of the visibility of information on research in the web pages of selected universities. This has allowed us to make certain proposals for improvement that can contribute to the excellence of its dissemination.

? Requena, J. (2005), Dynamics of the modern Venezuelan research community profile. *Scientometrics*, **65** (1), 95-130.

Full Text: [2005\Scientometrics65, 95.pdf](2005/Scientometrics65,%2095.pdf)

Abstract: The main characteristics, human resources, organizational development, R&D output and outcome of the Venezuelan scientific and technological community, are studied in depth for three specific dates - years 1954, 1983 and 1999 -, aiming to reveal its strengths and weaknesses and to establish its dynamics. During the first half of the twentieth century, Venezuela had no major organized or institutionalized scientific activity. From 1954 thru 1983, the State built a considerable number of institutions mostly for research and development activities. Initially, researchers came from classical professions but were later substituted by graduates in scientific and technological disciplines. Biomedical and basic sciences are the areas of knowledge favored by researchers while, in terms of intellectual creation, social sciences and humanities seem to be the less productive, despite being one of the fields of knowledge embraced by most professionals. Although from 1983 on there has been no major input to the national S&T system, the research community showed a few years of growth in absolute terms in the number of publications, however national productivity decreased during the last decade of the century. It is believed that this reflects an aging, asphyxiated and self-consuming community using its reserves at a maximum rate. The S&T system constructed exhibits a dominance of the public sector that privileged, financially, the hydrocarbon related technological/service industry at the expense of academic research in universities while maintaining agribusiness related service and developmental research at the same level of expenditure throughout the last twenty years of the twentieth century. While the generation - practically from zero - of a modern R&D community in Venezuela, together with higher education, could well be one of the most significant accomplishments of democracy in Venezuela, this remarkable social achievement has been put in peril by neglect and changes in public policies. Downturn of the national S&T system is bound to worsen due to a virtual collapse, on February 4, 2002, of the R&D centre of the nationalized oil industry.

Keywords: Achievement, Activities, Aging, Democracy, Depth, Development, Dynamics, Education, Growth, Higher Education, Human, Industry, Knowledge, Neglect, Outcome, Policies, Productivity, Profile, Publications, Research, Research and Development, Researchers, Science, Sciences, Scientific Community, Social, Social Sciences, Universities, Women

? Mccain, K.W., Verner, J.M., Hislop, G.W., Evanco, W. and Cole, V. (2005), The use of bibliometric and Knowledge Elicitation techniques to map a knowledge domain: Software Engineering in the 1990s. *Scientometrics*, **65** (1), 131-144.

Full Text: [2005\Scientometrics65, 131.pdf](2005/Scientometrics65,%20131.pdf)

Abstract: Parallel mappings of the intellectual and cognitive structure of Software Engineering (SE) were conducted using Author Cocitation Analysis (ACA), PFNet Analysis, and card sorting, a Knowledge Elicitation (KE) method. Cocitation counts for 60 prominent SE authors over the period 1990 - 1997 were gathered from SCISEARCH. Forty-six software engineers provided similar data by sorting authors’ names into labeled piles. At the 8 cluster level, ACA and KE identified similar author clusters representing key areas of SE research and application, though the KE labels suggested some differences between the way that the authors’ works were used and how they were perceived by respondents. In both maps, the clusters were arranged along a horizontal axis moving from ‘micro’ to ‘macro’ level R&D activities (correlation of X axis coordinates = 0.73). The vertical axis of the two maps differed (correlation of Y axis coordinates = -0.08). The Y axis of the ACA map pointed to a continuum of high to low formal content in published work, whereas the Y axis of the KE map was anchored at the bottom by ‘generalist’ authors and at the top by authors identified with a single, highly specific and consistent specialty. The PFNet of the raw ACA counts identified Boehm, Basili, and Booch as central figures in subregions of the network with Boehm being connected directly or through a single intervening author with just over 50% of the author set. The ACA and KE combination provides a richer picture of the knowledge domain and provide useful cross-validation.

? Kharbanda, V.P. (2005), China’s scientific elite. *Scientometrics*, **65** (1), 145-149.

Full Text: [2005\Scientometrics65, 145.pdf](2005/Scientometrics65,%20145.pdf)

? Garg, K.C., Gupta, B.M., Jamal, T., Roy, S. and Kumar, S. (2005), Assessment of impact of AICTE funding on R&D and educational development. *Scientometrics*, **65** (2), 151-160.

Full Text: [2005\Scientometrics65, 151.pdf](2005/Scientometrics65,%20151.pdf)

Abstract: An analysis of 330 questionnaires received from project investigators funded by AICTE indicates that project investigators preferred to present their research results at conferences rather than in national and international journals. Impact of funding has been better on human resource capability development as compared to research and technological output. Analysis of data using data envelopment analysis indicates that projects funded under electronics and communication engineering, mechanical engineering, electrical engineering and management displayed some consistency and uniformity with regard to impact on various output parameters.

Araujo Ruiz, J.A., van Hooydonk, G., Torricella Morales, R.G. and Jorge, R.A. (2005), Cuban scientific articles in ISI Citation Indexes and CubaCiencias databases (1988-2003). *Scientometrics*, **65** (2), 161-171.

Full Text: [2005\Scientometrics65, 161.pdf](2005/Scientometrics65,%20161.pdf)

Abstract: This comparative study covers the period 1988-2003 of the Institute for Scientific Information Databases (ISI-DBs), CD-ROM edition: Science Citation Index (SCI), Social Sciences Citation Index (SSCI) and Arts & Humanities Citation Index (A&HCI) as international databases and from the CubaCiencias (CubaCiencias) as an internal database. The number of articles published in Cuban journals, ISI-DBs, the author associativeness trend, the most important institutions and other indicators are collected. However, it is observed that CubaCiencias and ISI-DBs are not perfectly suitable for a study of the productivity of Cuban authors. It is necessary to properly standardize the author fields. For bibliometric studies, Cuba needs a database not only for the published papers in Cuban journals, but also for all the papers published by Cuban authors.

Keywords: Bibliometric, Bibliometric Studies, Cd-Rom, Citation, Citation Indexes, Comparative Study, Database, Databases, Indicators, Institute for Scientific Information, Institutions, International, ISI, Journals, Needs, Papers, Productivity, SCI, Science Citation Index, SSCI, Trend

? Bartol, T. and Hocevar, M. (2005), The capital cities of the ten new European Union countries in selected bibliographic databases. *Scientometrics*, **65** (2), 173-187.

Full Text: [2005\Scientometrics65, 173.pdf](2005/Scientometrics65,%20173.pdf)

Abstract: The aim is to investigate the cities based on the author-affiliation data from Web of Science, Biosis Previews, CAB Abstracts, Chemical Abstracts, Compendex/Inspec, Francis, Medline, Pascal, and Sociological Abstracts databases. Specifics of particular cities and publishing patterns and trends with reference to particular disciplines are studied. Characteristics of city-data collection with regard to retrieval accuracy are investigated. Databases are compared regarding document coverage and input consistency. A city as an emerging supranational unit is proposed as a scientometric object and indicator in its own right as a complement to the traditional notion of a country or a nation-state.

? Lluch, J.O. (2005), Some considerations on the use of the impact factor of scientific journals as a tool to evaluate research in psychology. *Scientometrics*, **65** (2), 189-197.

Full Text: [2005\Scientometrics65, 189.pdf](2005/Scientometrics65,%20189.pdf)

Abstract: This paper identifies and presents some characteristics of the psychology journals included in each of the *Journal Citation Reports* (JCR) categories in 2002. The study shows that most of the journals belong to the categories of Multidisciplinary Psychology (102) and Clinical Psychology (83). Their ranking is seen to vary depending on the category, and the same journal may occupy different positions in different JCR categories. Journals included in the categories of Biological Psychology, Experimental Psychology and Multidisciplinary Psychology had the highest impact factor (IF).

? Dastidar, P.G. and Ramachandran, S. (2005), Engineering research in ocean sector: An international profile. *Scientometrics*, **65** (2), 199-213.

Full Text: [2005\Scientometrics65, 199.pdf](2005/Scientometrics65,%20199.pdf)

Abstract: In this paper attempt has been made to study the engineering research scenario in ocean sector across the countries - globally. To understand the research dynamics, the articles appeared in Science Citation Index (SCI) database under Ocean Engineering category in the year 2000 were analyzed to visualize the structure of the field. USA and UK are the major producers - 62% of the total output contributed by them. The cooperation linkages between engineers, organizations, countries and journals were mapped. The causal linkages between the productivity function and the socio-economic imperatives of the production units were studied. 62% output in this sector goes to USA & UK. They are also toppers in collaboration centrality list. National Oceanic Atmospheric Administration (NOAA), USA, National Aeronautics and Space Administration (NASA), USA, National Institute of Oceanography (NIO), India are the most productive institutions. GDP explains only 36% of variance in productivity (R2 = 0.36). M Longuethiggins and CC Mei are the most cited authors in the field. Co-citation maps of cited authors and cited journals throw light on the semantic structure of the field. Studies in wave mechanics and modeling of waves are the most important areas of research in Ocean Technology.

? Guan, J.C. and He, Y. (2005), Comparison and evaluation of domestic and international outputs in Information Science & Technology research of China. *Scientometrics*, **65** (2), 215-244.

Full Text: [2005\Scientometrics65, 215.pdf](2005/Scientometrics65,%20215.pdf)

Abstract: The purpose of this paper is to evaluate the basic research performance of key projects in the field of information science & technology funded by National Natural Science Foundation of China (NSFC) from both international and national perspectives during the period 1994-2001, based upon the Science Citation Index (SCI) and China Scientific and Technical Papers and Citations (CSTPC) databases. We compare the international and domestic outputs of the key projects by applying various scientometric indicators and techniques. The findings indicate that, as a whole, the research performances of the key projects have, to different degrees, increased in both international and domestic papers during the period of study. Semiconductor is the internationally most productive sub-discipline and Automatization is the domestically most productive sub-discipline, measured on average per project. The Combination Impact Factor (CIF), which integrates the CSTPC-IF and the SCI-IF into the evaluation process, is further proposed for the combined evaluation of domestic and international outputs of the key projects. In terms of ratio of CIF relative to the funds in each sub-discipline, results also show that Semiconductor is the most productive sub-discipline and Computer is the least productive one. Using correlation analysis a significant and positive relationship between the SCI-IF and the CIF has been found for the evaluated projects.

? Jarneving, B. (2005), A comparison of two bibliometric methods for mapping of the research front. *Scientometrics*, **65** (2), 245-263.

Full Text: [2005\Scientometrics65, 245.pdf](2005/Scientometrics65,%20245.pdf)

Abstract: This paper builds on previous research concerned with the classification and specialty mapping of research fields. Two methods are put to test in order to decide if significant differences as to mapping results of the research front of a science field occur when compared. The first method was based on document co-citation analysis where papers citing co-citation clusters were assumed to reflect the research front. The second method was bibliographic coupling where likewise citing papers were assumed to reflect the research front. The application of these methods resulted in two different types of aggregations of papers: (1) groups of papers citing clusters of co-cited works and (2) clusters of bibliographically coupled papers. The comparision of the two methods as to mapping results was pursued by matching word profiles of groups of papers citing a particular co-citation cluster with word profiles of clusters of bibliographically coupled papers. Findings suggested that the research front was portrayed in two considerably different ways by the methods applied. It was concluded that the results in this study would support a further comparative study of these methods on a more detailed and qualitative ground. The original data set encompassed 73,379 articles from the fifty most cited environmental science journals listed in *Journal Citation Report*, science edition downloaded from the Science Citation Index on CD-ROM.

? Rousseau, R. (2005), Peter Ingwersen: Recipient of the 2005 Derek de Solla Price Award of the journal scientometrics. *Scientometrics*, **65** (3), 267-269.

Full Text: [2005\Scientometrics65, 267.pdf](2005/Scientometrics65,%20267.pdf)

? McCain, C. (2005), Howard D White: Recipient of the 2005 Derek de Solla Price Award of the journal scientometrics. *Scientometrics*, **65** (3), 271-273.

Full Text: [2005\Scientometrics65, 271.pdf](2005/Scientometrics65,%20271.pdf)

? Egghe, L. (2005), The share of items of highly productive sources as a function of the size of the system. *Scientometrics*, **65** (3), 275-291.

Full Text: [2005\Scientometrics65, 275.pdf](2005/Scientometrics65,%20275.pdf)

Abstract: The research in this paper is based on the paper of D.W. Aksnes & G. Sivertsen: The effect of highly cited papers on national citation indicators, Scientometrics 59 (2) (2004), 213-224, where one states that ‘the few highly cited papers account for the highest share of the citations in the smallest fields’.

This, at first sight, evident property is examined in the theoretical models that exist in the literature. We first define exactly what we mean by ‘size of a field’ (i.e. when is a field ‘smaller’ or ‘larger’ than another one). We show that there are two, non-equivalent possible definitions. Next we define exactly the possible property under study. This leads us again to two possible, non-equivalent formulations. Hence, in total, there are four different formulations to consider.

We show, by giving counterexamples, that none of these four formulations are true in general. We also express conditions (in Lotkaian and Zipfian informetrics), under which the property of Aksnes and Sivertsen is true.

All these results are not only valid in the papers-citations relationships but in any informetric source-item relationship. In this connection we present formulae describing the share of items of highly productive sources as a function of the parameters of the system (e.g. the size of the system).

Keywords: Cited Papers

? Sombatsompop, N., Markpin, T., Yochai, W. and Saechiew, M. (2005), An evaluation of research performance for different subject categories using Impact Factor Point Average (IFPA) index: Thailand case study. *Scientometrics*, **65** (3), 293-305.

Full Text: [2005\Scientometrics65, 293.pdf](2005/Scientometrics65,%20293.pdf)

Abstract: The research performance of Thai researchers in various subject categories was evaluated using a new mathematical index entitled “Impact Factor Point Average” (IFPA), by considering the number of published papers in journals listed in the Science Citation Index (SCI) database held by the Institute for Scientific Information (ISI) for the years 1998-2002, and the results compared with the direct publication number (PN) and publication credit (PC) methods. The results suggested that the PN and PC indicators cannot be used for comparison between fields or countries because of the strong field-dependence. The IFPA index, based on a normalization of differences in impact factors, rankings, and number of journal titles in different subject categories, was found to be simple and could be used with equality for accurate assessment of the quality of research work in different subject categories. The results of research performance were found to be dependent on the method used for the evaluations. All evaluation methods indicated that Clinical Medicine was ranked first in terms of the research performance of Thai scholars listed in the SCI database, but exhibited the lowest improvement of performance. Chemistry was shown to be the most improved subject category.

Keywords: Assessment, Chemistry, Citation, Differences, Evaluation, Impact, Impact Factor, Impact Factors, ISI, Journal, Journals, Papers, Publication, Quality, Rankings, Research, Research Performance, Research Work, Researchers, SCI, Science, Science Citation Index, Scientific Information, Subject Category

? Coccia, M. (2005), A scientometric model for the assessment of scientific research performance within public institutes. *Scientometrics*, **65** (3), 307-321.

Full Text: [2005\Scientometrics65, 307.pdf](2005/Scientometrics65,%20307.pdf)

Abstract: Nowadays, the Italian science sector is undergoing a strategic reform due to budget cuts and there is a need for measuring and evaluating research performance of public research institutes. This research presents a new measure to assess the scientific research performance of public research institutes. The new model is successfully applied to 108 public research institutes belonging to the Italian National Research Council, using data from year 2003 and displays the laboratories with high/low performance. The results are substantially stronger and quicker to obtain than those calculated by using conventional indicators. This model supports the policy-makers, who must decide about the level and direction of public funding for research and technology transfer.

Keywords: Research-and-Development, Higher-Education, Productivity, Indicators, Efficiency

? Glanzel, W. and Schubert, A. (2005), Domesticity and internationality in co-authorship, references and citations. *Scientometrics*, **65** (3), 323-342.

Full Text: [2005\Scientometrics65, 323.pdf](2005/Scientometrics65,%20323.pdf)

Abstract: As a first element of a macro-level country-by-country cross-reference and cross-citation analysis, domestic/international character of reference and citation behavior of 36 countries is studied and compared with international co-authorship patterns. Indicators of reference and citation domesticity as well as reference-citation domesticity balance are constructed and presented. Science policy relevance of these indicators is discussed and examples deserving science policy attention are pinpointed.

Keywords: Analysis, Attention, Balance, Behavior, Citation, Citations, Co-Authorship, Coauthorship, Indicators, Policy, Science, Science Policy

? Ma, N. and Guan, J.C. (2005), An exploratory study on collaboration profiles of Chinese publications in Molecular Biology. *Scientometrics*, **65** (3), 343-355.

Full Text: [2005\Scientometrics65, 343.pdf](2005/Scientometrics65,%20343.pdf)

Abstract: As science has become much complex and sophisticated, greater attention is paid to scientific collaboration within recent bibliometric studies. A total of 6538 publications in Molecular Biology from China during 1999-2003, as indicated by data collected from database of the Science Citation Index Expanded - Web Edition, have been analyzed. A large proportion of publications have been authored by more than 3 scientists. The composition of publications grouped by collaboration patterns are: 1.58% non-collaborative papers, 42.43% local papers, 34.37% domestic papers and 21.62% international papers on average during the studied period. The countries with which China has collaborative links and their frequencies are all itemized to indicate the intensity of international collaboration in the field of Molecular Biology. Finally, the differences between the impact of wholly indigenous papers and internationally collaborative papers have been compared. The results indicate that foreign collaboration does contribute a lot to the improvement of the mainstream connectivity and international visibility.

Keywords: International Scientific Collaboration, Co-Authorship, Research Performance, Impact Factor, Science, 20th-Century, Cooperation, Technology, Patterns

? Hanney, S., Frame, I., Grant, J., Buxton, M., Young, T. and Lewison, G. (2005), Using categorisations of citations when assessing the outcomes from health research. *Scientometrics*, **65** (3), 357-379.

Full Text: [2005\Scientometrics65, 357.pdf](2005/Scientometrics65,%20357.pdf)

Abstract: This paper describes an attempt to explore how far a categorisation of citations could be used as part of an assessment of the outcomes from health research. A large-scale project to assess the outcomes from basic, or early clinical, research is being planned, but before proceeding with such a project it was thought important to test and refine the developing methods in a preliminary study. Here we describe the development, and initial application, of one element of the planned methods: an approach to categorising citations with the aim of tracing the impact made by a body of research through several generations of papers. The results from this study contribute to methodological development for the large-scale project by indicating that: only for a small minority of citing papers is the cited paper of considerable importance; the number of times a paper is cited can not be used to indicate the importance of that paper to the articles that cite it; and self-citations could play an important role in facilitating the eventual outcomes achieved from a body of research.

Keywords: Assessment, Author Self-Citations, Behavior, Biomedical-Research, Citations, Communication, Context Analysis, Development, Impact, Improvement, Indicators, Motivations, Outcomes, Papers, References, Research, Science

? Burrell, Q.L. (2005), Are “sleeping beauties” to be expected? *Scientometrics*, **65** (3), 381-389.

Full Text: [2005\Scientometrics65, 381.pdf](2005/Scientometrics65,%20381.pdf)

Abstract: A paper that is little cited (‘sleeps’) for a long period of time and then becomes much cited (‘is awakened’), has been termed by van Raan (2004) a ‘Sleeping Beauty’, or a paper that was ‘ahead of its time’. The inference is that the importance of the paper was not initially recognised, only later was it (re)discovered. On the other hand, much theoretical work in informetrics views the citation process as being purely random - modelled by an appropriate stochastic process. From this point of view, the ‘awakening’ could simply be a matter of chance without necessarily saying anything about the worth of the paper. The question therefore arises as to whether such awakenings can be explained or expected purely by the random nature of the model or whether they are so unlikely that an alternative explanation should be sought. In this note we express the notion of a Sleeping Beauty in terms of a well-known stochastic model and seek to answer this question, at least in general terms.

Keywords: Alternative, Citation, Citation Distribution, Delayed Recognition, Hand, Informetrics, Model, Process, Stochastic-Model

? Bornmann, L. and Daniel, H.D. (2005), Does the h-index for ranking of scientists really work? *Scientometrics*, **65** (3), 391-392.

Full Text: [2005\Scientometrics65, 391.pdf](2005/Scientometrics65,%20391.pdf)

Abstract: Hirsch (2005) has proposed the h-index as a single-number criterion to evaluate the scientific output of a researcher (Ball, 2005): A scientist has index h if h of his, her N-p papers have at least h citations each, and the other (N-p - h) papers have fewer than h citations each. In a study on committee peer review (Bornmann & Daniel, 2005) we found that on average the h-index for successful applicants for post-doctoral research fellowships was consistently higher than for non-successful applicants.

Keywords: Citations, h Index, h-Index, Hirsch, Index h, Papers, Peer Review, Peer-Review, Ranking, Research, Review, Scientific Output, Work

? Wooding, S., Wilcox-Jay, K., Lewison, G. and Grant, J. (2006), Co-author inclusion: A novel recursive algorithmic method for dealing with homonyms in bibliometric analysis. *Scientometrics*, **66** (1), 11-21.

Full Text: [2006\Scientometrics66, 11.pdf](2006/Scientometrics66,%2011.pdf)

Abstract: Large scale bibliometric analysis is often hindered by the presence of homonyms, or namesakes, of the researchers of interest in literature databases. This makes it difficult to build up a true picture of a researcher’s publication record, as publications by another researcher with the same name will be included in search results. Using additional information such as title and author addresses, an expert in the field can generally tell if a paper is by a researcher or a namesake, however, manual checking is not practical in large scale studies. Previously various methods have been used to address this problem, chiefly based on filtering by subject, funding acknowledgement or author address. Co-author inclusion is a novel algorithmic method based on co-authorship for dealing with problems of homonyms in large bibliometric surveys. We compared co-author inclusion and subject and funding based filter against the manual assignment of papers by a subject expert (which we assumed to be correct). The subject and funding based filtering identifies only 75% as many papers as assigned by manual scoring. By using co-author inclusion once we increase this to 95%, two further rounds produces 99% as many papers as manual filtering. Although the number of papers identified that were not assigned to the PIs manually also increases, the absolute number is low: rising from 0.2% papers with subject and funding filtering, to 3% papers for three rounds of co-author inclusion.

Keywords: Publications

? Sangam, S.L., Savanur, K., Manjunath, M. and Vasudevan, R. (2006), Scientometric portrait of Prof. Peter John Wyllie. *Scientometrics*, **66** (1), 43-53.

Full Text: [2006\Scientometrics66, 43.pdf](2006/Scientometrics66,%2043.pdf)

Abstract: Scientometrics is an application of quantitative methods to the history of Science. It is also one of the techniques for documenting, collecting works of eminent scientists and researcher’s. In this paper, we present a concise sketch of Prof. Peter John Wyllie, stressing on his scientific achievements. His research has had a great impact in the fields dealing with terrestrial magmatic phenomena and geology.

Keywords: Research

? Thijs, B. and Glänzel, W. (2006), The influence of author self-citations on bibliometric meso-indicators. The case of European universities. *Scientometrics*, **66** (1), 71-80.

Full Text: [2006\Scientometrics66, 71.pdf](2006/Scientometrics66,%2071.pdf)

Abstract: In earlier studies by the authors, basic regularities of author self-citations have been analysed. These regularities are related to the ageing, to the relation between self-citations and foreign citations, to the interdependence of self-citations with other bibliometric indicators and to the influence of co-authorship on self-citation behaviour. Although both national and subject specific peculiarities influence the share of self-citations at the macro level, the authors came to the conclusion that - at this level of aggregation - there is practically no need for excluding self-citations. The aim of the present study is to answer the question in how far the influence of author self-citations on bibliometric meso-indicators deviates from that at the macro level, and to what extent national reference standards can be used in bibliometric meso analyses. In order to study the situation at the institutional level, a selection of twelve European universities representing different countries and different research profiles have been made. The results show a quite complex situation at the meso-level, therefore we suggest the usage of both indicators, including and excluding self-citations.

Keywords: Macro, Research

? Nederhof, A.J. (2006), Bibliometric monitoring of research performance in the social sciences and the humanities: A review. *Scientometrics*, **66** (1), 81-100.

Full Text: [2006\Scientometrics66, 81.pdf](2006/Scientometrics66,%2081.pdf)

Abstract: This paper addresses research performance monitoring of the social sciences and the humanities using citation analysis. Main differences in publication and citation behavior between the (basic) sciences and the social sciences and humanities are outlined. Limitations of the (S)SCI and A&HCI for monitoring research performance are considered. For research performance monitoring in many social sciences and humanities, the methods used in science need to be extended. A broader range of both publications (including non-ISI journals and monographs) and citation indicators (including non-ISI reference citation values) is needed. Three options for bibliometric monitoring are discussed.

Keywords: Behavioral-Sciences, Books, Impact, Indicators, Journals, Publication, Publications, Reference Networks, Research, Scientific Literature, Sociology Citation Index, University Departments

? Rojo, R. and Gómez, I. (2006), Analysis of the Spanish scientific and technological output in the ICT sector. *Scientometrics*, **66** (1), 101-121.

Full Text: [2006\Scientometrics66, 101.pdf](2006/Scientometrics66,%20101.pdf)

Abstract: This study presents a general view of the scientific and technological production in the ICT sector in Spain during the period 1990-2002 and its relative weight in the international production, as well as the identification of the main institutional actors and the performance patterns of the researchers in this scientific community through bibliometric techniques, with the aim of exploring the character of its outputs, both in terms of publications and patents. Indicators at macro-meso level are presented by: geographic regions, thematic areas at different aggregation levels, institutional sectors and research centres. Bibliometric indicators may help focus attention on the position and contribution of Spanish ICT science and technological capabilities.

Keywords: Communication Technologies, Information, Performance, Publications, Research, Science, Semiconductor Literature

? van Leeuwen, T. (2006), The application of bibliometric analyses in the evaluation of social science research. Who benefits from it, and why it is still feasible. *Scientometrics*, **66** (1), 133-154.

Full Text: [2006\Scientometrics66, 133.pdf](2006/Scientometrics66,%20133.pdf)

Abstract: The paper discusses an application of bibliometric techniques in the social sciences. While the interest of policy makers is growing, the topic is getting more and more attention from bibliometricians. However, many efforts are put into developing tools to measure scientific output and impact outside the world of the Social Sciences Citation Index, while the use of the SSCI for bibliometric applications is covered with obscurity and myths. This study attempts to clarify some of the topics mentioned against the application of the SSCI for evaluation purposes. The study will cover topics like the existing publication and citation culture within the social sciences, the effect of variable citation windows, and the (geographical) origin of citation flows.

Keywords: Analyses, Application, Bibliometric, Bibliometric Analyses, Bibliometric Techniques, Citation, Culture, Developing, Evaluation, Impact, Measure, Origin, Policy, Publication, Research, Science, Science Research, Sciences, Scientific Output, Social, Social Sciences, SSCI, Techniques, World

? Lundberg, J., Fransson, A., Brommels, M., Skår, J. and Lundkvist, I. (2006), Is it better or just the same? Article identification strategies impact bibliometric assessments. *Scientometrics*, **66** (1), 183-197.

Full Text: [2006\Scientometrics66, 183.pdf](2006/Scientometrics66,%20183.pdf)

Abstract: This study demonstrates that the choice of search strategy for article identification has an impact on evaluation and policy analysis of research areas. We have assessed the scientific production in two areas at one research institution during a ten-year period. We explore the recall and precision of three article identification strategies: journal classifications, keywords and authors. Our results show that the different search strategies have varying recall (0.38-1.00) and precision (0.50-1.00). In conclusion, uncritical analysis based on rudimentary article identification strategies may lead to misinterpretation of the development of research areas, and thus provide incorrect data for decision-making.

Keywords: European-Union, Research

? Must, Ü. (2006), ‘New ‘countries in Europe - Research, development and innovation strategies vs bibliometric data. *Scientometrics*, **66** (2), 241-248.

Full Text: [2006\Scientometrics66, 241.pdf](2006/Scientometrics66,%20241.pdf)

Abstract: The main objective of this paper is to observe to what extent research priorities set in R&D policy strategy documents are supported with publication and citation data, delivered from ISI databases. As supporting background information the results of questionnaire sent to the Committee of Senior Officials of the Co-operation in the field of Scientific and Technical Research are used.

Keywords: Collaboration, Indicators, Research

? Calero, C., Buter, R., Valdés, C.C. and Noyons, E. (2006), How to identify research groups using publication analysis: an example in the field of nanotechnology. *Scientometrics*, **66** (2), 365-376.

Full Text: [2006\Scientometrics66, 365.pdf](2006/Scientometrics66,%20365.pdf)

Abstract: We present a new bibliometric approach to identify research groups in a particular research field. With a combination of bibliometric mapping techniques and network analysis we identify and classify clusters of authors to represent research groups. In this paper we illustrate the application and potential of this approach and present two types of outcomes: actual research groups and potential research groups. The former enables us to define research groups beyond the organizational structure. The latter may be used to identify potential partners for collaboration. Our approach is a starting point to deal with the complex issue of research groups in a changing structure of scientific research.

Keywords: Network, Research

? Buter, R.K., Noyons, E.C.M., Van Mackelenbergh, M. and Laine, T. (2006), Combining concept maps and bibliometric maps: First explorations. *Scientometrics*, **66** (2), 377-387.

Full Text: [2006\Scientometrics66, 377.pdf](2006/Scientometrics66,%20377.pdf)

Abstract: Bibliometric maps of science are a well-established research subject. But their adoption as a science policy support tool is lacking. We think this is because the user does not immediately comprehend a map and (as a result) is not enticed into using it. To help this comprehension, we propose the use of “ qualitative maps “: an umbrella term for diverse tools such as concept maps and mental maps. We developed a tool that interfaces between a qualitative map and a bibliometric map which lets the user create a correspondence between the distinct vocabularies of the maps. We also conducted two user studies: the first explored the combined use of bibliometric and qualitative maps and the second the preferred format of the map and the word-usage in the description of its elements.

Keywords: Networks, Research, Science

? Cahlík, T. and Jiřina, M. (2006), Law of cumulative advantages in the evolution of scientific fields. *Scientometrics*, **66** (3), 441-449.

Full Text: [2006\Scientometrics66, 441.pdf](2006/Scientometrics66,%20441.pdf)

Abstract: The evolution of scientific fields analyzed by co-word analysis and presented in strategic diagrams is simulated based on the law of cumulative advantages - the probability of a new tie between two keywords depends positively on the frequencies in which both keywords have taken part already. The results we get from simulations are compared with the results of real scientific field evolution. We consider the high correspondence of both to be a proof of the working of the law of cumulative advantages in the development of scientific fields and we believe that our research opens new possibilities for predictions of the development of scientific fields.

Keywords: Economics

? Ackermann, E. (2006), Indicators of failed information epidemics in the scientific journal literature: A publication analysis of Polywater and Cold Nuclear Fusion. *Scientometrics*, **66** (3), 451-466.

Full Text: [2006\Scientometrics66, 451.pdf](2006/Scientometrics66,%20451.pdf)

Abstract: A literature review uncovered six distinctive indicators of failed information epidemics in the scientific journal literature: (1) presence of seminal papers(s), (2) rapid growth, decline in author frequency, (3) multi-disciplinary research, (4) epidemic growth, decline in journal publication frequency, (5) predominance of rapid communication journal publications, and (6) increased multi-authorship. These indicators were applied to journal publication data from two known failed information epidemics, Polywater and Cold Nuclear Fusion. Indicators 1-4 were distinctive of the failed epidemics, Indicator 6 was not, and Indicator 5 might be. Further bibliometric study of these five indicators in the context of other epidemic literatures needed.

Keywords: Anomalous Water, Field, Growth, Science, Superstring Theory

? Miguel-Dasit, A., Marti-Bonmati, L., Aleixandre, R., Sanfeliu, P. and Valderrama, J.C. (2006), Publications resulting from Spanish radiology meeting abstracts: Which, where and who. *Scientometrics*, **66** (3), 467-480.

Full Text: [2006\Scientometrics66, 467.pdf](2006/Scientometrics66,%20467.pdf)

Abstract: Many abstracts submitted to medical meetings never come to full publication in peer-reviewed journals. From the 2,992 abstracts presented at the 1994-1998 Spanish Congresses of Radiology, 464 (15%) were published as full articles in journals covered by the Medline and IME (Aindice Medico Espanol), the Spanish medical database. The publication rate of oral presentations was higher than that of posters (18% versus 13%). Collaboration between radiologists and clinicians and between radiologists from different institutions increased full publication (21% and 27%, respectively) compared to abstracts from just one institution (14%). Therefore, oral presentations, multi-disciplinary and multi-institutional collaboration in the abstract predicted full publication.

Keywords: Authorship, Collaboration, Fate, Journals, Rates, Scientometric Analysis, Society Meetings, Subsequent Publication

? van Zeebroeck, N., De la Potterie, B.V. and Han, W. (2006), Issues in measuring the degree of technological specialisation with patent data. *Scientometrics*, **66** (3), 481-492.

Full Text: [2006\Scientometrics66, 481.pdf](2006/Scientometrics66,%20481.pdf)

Abstract: This paper analyses several issues that arise when measuring technological specialisation with patent data. Three starting choices are required regarding the data source, the statistical measure and the sectoral aggregation level. We show that the measure is highly sensitive to the data source and to the level of sectoral aggregation. The statistical analysis further suggests that the most stable and reliable measures of technological specialization are obtained with patents applied at the EPO, with Gini or C20 as statistical measure and the 4-digits aggregation level of the IPC classification system.

Keywords: 27 Science Areas, 50 Nations, Scientometric Weight, Statistics

? Cincera, M., De la Potterie, B.V. and Veugelers, R. (2006), Assessing the foreign control of production of technology: The case of a small open economy. *Scientometrics*, **66** (3), 493-512.

Full Text: [2006\Scientometrics66, 493.pdf](2006/Scientometrics66,%20493.pdf)

Abstract: International R&D activities have grown significantly over the last two decades. Both the number of actors involved, as well as the importance of the technological activity carried out abroad, has considerably increased. We aim to quantify the international generation of knowledge for the case of Belgium, using indicators based on EPO and USPTO patent data (1978-2001). We distinguish among Belgian applicants, affiliates of foreign firms located in Belgium as well as Belgian based firms with affiliates abroad. This approach allows to improve existing indicators of internationalisation of technology based on patent data. The results are consistent with what can be expected for a small open economy as Belgium. A large part of patents with Belgian inventors are assigned to Belgian affiliates of foreign firms. Hence our more complete indicator of foreign ownership gives a substantially higher foreign control of Belgian inventors. Relatively more knowledge generated by Belgian inventors flows out of the country towards foreign owners of technology, than that knowledge generated abroad is owned by Belgian patent applicants. But the share of foreign inventors to Belgian assigned patents is considerably increasing over time, especially in the subcategory of Belgian firms with foreign affiliates.

Keywords: Corporation, Globalization, Internationalization, Knowledge, Multinational-Enterprises, Organization, Patent Statistics, Patterns, Research-and-Development

? Lin, M.H., Chen, L.K., Hwang, S.J., Weiss, B.D., Chou, L.F. and Chen, T.J. (2006), The impact of impact factor on small specialties: A case study of family medicine in Taiwan. *Scientometrics*, **66** (3), 513-520.

Full Text: [2006\Scientometrics66, 513.pdf](2006/Scientometrics66,%20513.pdf)

Abstract: The Science Citation Index (SCI) with its coverage of journals has been forming a criterion for the performance assessment of researchers worldwide. If the journals of a specialty were under-proportionally indexed, its development in research could be distorted in the long term. A MEDLINE-based bibliometric analysis of research output by family medicine departments in Taiwan from 1990 to 2003 might help to provide some evidence of the influence of SCI on the developing disciplines.

Keywords: Publications

? Sombatsompop, N., Kositchaiyong, A., Markpin, T. and Inrit, S. (2006), Scientific evaluations of citation quality of international research articles in the SCI database: Thailand case study. *Scientometrics*, **66** (3), 521-535.

Full Text: [2006\Scientometrics66, 521.pdf](2006/Scientometrics66,%20521.pdf)

Abstract: Quantitative and qualitative scientific evaluations of the research performance of Thai researchers were carried out with regards to their international publications and citations in four different subject categories, namely Clinical Medicine, Chemistry, Material Sciences, and Engineering. This work used citations to publications of Thai researchers in the Science Citation Index (SCI) database during 1998-2002 as a data source. The calculations and comparisons of article impact factors (AIF), position impact factors (PIF) and journal impact factors (JIF) were attempted for quantitative evaluation.The positions and significance levels (cited contents) of the citations were considered for qualitative assessment.For quantitative evaluation, the highest article quantity and number of times cited were given by Thai researchers in Clinical Medicine, the lowest being for Material Sciences. Clinical Medicine had the highest AIF value, while Engineering exhibited the lowest. Each article by Thai researchers was found to be cited more than once within a citing article, especially articles in Clinical Medicine. For qualitative assessment, most articles from Thai scholars were cited in Introduction and Results & Discussion sections of the citing articles. Only non-Thai researchers in Clinical Medicine preferred to use Discussion from Thais’ articles for discussion of their work whereas those in Chemistry, Material Sciences and Engineering were referred as general references. Less than 1.5% of research works of Thai scholars were cited as ‘the pioneer ‘for the research communities of the subject categories of interest.

Keywords: Impact Factors, Journal Impact

? Egghe, L., Rao, I.K.R. and Sahoo, B.B. (2006), Proof of a conjecture of Moed and Garfield on authoritative references and extension to non-authoritative references. *Scientometrics*, **66** (3), 537-549.

Full Text: [2006\Scientometrics66, 537.pdf](2006/Scientometrics66,%20537.pdf)

Abstract: In a recent paper [H. F. Moed, e. Garfield: In basic science the percentage of ‘Authoritative ‘References decreases as bibliographies become shorter. Scientometrics 60 (3) (2004) 295-303] The authors show, experimentally, the validity of the statement in the title of their paper. In this paper we give a general informetric proof of it, under certain natural conditions. The proof is given both in the discrete and the continuous setting. An easy corollary of this result is that the fraction of non-authoritative references increases as bibliographies become shorter. This finding is supported by a set of data of the journal information processing and management (2002 + 2003) With respect to the fraction of conference proceedings articles in reference lists.

Keywords: Science

? Uzun, A. (2006), Science and technology policy in Turkey. National strategies for innovation and change during the 1983-2003 period and beyond. *Scientometrics*, **66** (3), 551-559.

Full Text: [2006\Scientometrics66, 551.pdf](2006/Scientometrics66,%20551.pdf)

Abstract: An evaluation of Turkey’s science and technology (S & T) policy in the last two decades has been made by using various indicators of S & T and technological innovation. National trends in inputs for research and development (R & D) activities, publication output and patent data have been studied for the implications of the S & T policy from 1983 to 2003. Some of the findings on the outcomes of policy measures in terms of inputs to R & D and publication output are as follows: (1) Total R & D expenditure, as percent of gross domestic product (GDP), increased from 0.32% in 1990 to 0.67% in 2002, (2) the fraction of R & D in the total expenditure for technological innovation increased from 6.6% in 1995-1997 to 29.2% in 1998-2000, and (3) the number of papers in the journals covered in the Science Citation Index (SCI) of the Institute for Scientific Information (ISI) increased from 464 in 1983 to 12160 in 2003 - a more than 26-fold increase in the last two decades.

Keywords: Energy, Manufacturing-Industries

? Ball, R. and Tunger, D. (2006), Bibliometric analysis - A new business area for information professionals in libraries? *Scientometrics*, **66** (3), 561-577.

Full Text: [2006\Scientometrics66, 561.pdf](2006/Scientometrics66,%20561.pdf)

Abstract: Supplying library users with literature by a seamless linking of media is the goal of (scientific) libraries. By the digitization of primary and secondary data and the convergence of products and providers, libraries have already come very close to achieving this ideal. A digital library is the realization of this goal. However, many librarians are in danger of running out of imagination. What will come after the digital library? Will information professionals still be needed? What services can libraries offer? Bibliometric analysis is an example of new business areas in libraries. This paper will discuss what shape this service could take in practice, who needs it and what target groups exist in the scientific environment. Concrete examples of bibliometric analysis from the Central Library of Research Centre Julich will round off the overview.

? Süssmuth, B., Steininger, M. and Ghio, S. (2006), Towards a European economics of economics: Monitoring a decade of top research and providing some explanation. *Scientometrics*, **66** (3), 579-612.

Full Text: [2006\Scientometrics66, 579.pdf](2006/Scientometrics66,%20579.pdf)

Abstract: This study documents a decade of mainstream research output by European economics institutions. In contrast to previous European economics departmental rankings, we investigate the changing pattern of the ranking over two subperiods and a total decade. The validity of our bibliometric approach is demonstrated by a comparison with gradings of UK economic departments in the 2001 Research Assessment Exercise (RAE). We also provide some explanation of the ranking based on regional factors and institutional features. Strong evidence for the ‘institutional oligopoly’ of editors and authors hypothesis is found. However, in a dynamic context this departmental concentration of authorship and editorial board membership does not represent a ‘closed shop’. We find several departments entering the centre stage of economic mainstream for the first time towards the end of the 1990s.

Keywords: Authors, Core Journals, Journal Gatekeepers, Ourselves, Ranking, UK

? Jin, B.H., Rousseau, R. and Sun, X.X. (2006), Key Labs and Open Labs in the Chinese scientific research system: Their role in the national and international scientific arena. *Scientometrics*, **67** (1), 3-14.

Full Text: [2006\Scientometrics67, 3.pdf](2006/Scientometrics67,%203.pdf)

Abstract: Chinese science has developed rapidly over the latest fifteen years. It is said that it is now in a quantitative expansion phase. A series of programmes extending over a period of twenty years has resulted in more than 160 Key Labs and nearly 400 Open Labs at present. The organization and evaluation of this system of labs is one of the strategic measures for scientific resource reorganization in China. The role played by these labs is analysed in this article using data front the Chinese Science Citation Database (CSCD) and the Science Citation Index (SCI). Nowadays almost one quarter of all internationally oriented Chinese publications originate front these labs. The same is true for citations received by Chinese scientists in the SCI. Comparisons between SCI-based and CSCD-based performance results show that the relative academic impact of Key Labs and Open Labs is more international than domestic. Key Labs have a higher total production and receive more citations than Open Labs. Yet their impact, measured as citations per publication, is very similar. We conclude that when it comes to impact on the international scene, these labs have not yet led to a big step forward for Chinese science as a whole. The fact that in the year 2004 a new evaluation procedure has been put in place means that the Chinese scientific authorities have recognized this fact and are dealing with it.

Keywords: Journals, Science

? Hargens, L.L. and Herting, J.R. (2006), Analyzing the association between referees’ recommendations and editors’ decisions. *Scientometrics*, **67** (1), 15-26.

Full Text: [2006\Scientometrics67, 15.pdf](2006/Scientometrics67,%2015.pdf)

Abstract: We use a method that captures the intrinsic metrics of variables in a cross-tabulation to analyze data on the association between referee recommendations and editorial decisions at two scholarly journals. The method enables researchers to (1) determine the number of latent dimensions needed to account for this association, and (2) estimate scale values for both the referee-recommendation and the editorial-decision categories. We show that one latent dimension is sufficient to account for the association at each journal, and that both referee-recommendation categories and editorial-decision categories have scale values on the dimension that are consistent with their ostensible meanings.

Keywords: Cross-Classified Data, Manuscript, Models

? Lazega, E., Mounier, L., Jourda, M.T. and Stofer, R.L. (2006), Organizational vs. personal social capital in scientists’ performance: A multi-level network study of elite French cancer researchers (1996-1998). *Scientometrics*, **67** (1), 27-44.

Full Text: [2006\Scientometrics67, 27.pdf](2006/Scientometrics67,%2027.pdf)

Abstract: The difference between individual social capital and organizational (or corporate) social capital has been an important topic of research in sociology during the past decade. The existence of this difference between two forms of social capital evokes an old question in a new manner what matters most in explaining individual actors’ performance? Is it personal social or collective resources provided by the organization to which the individuals belong and in which they work? In this paper we provide a preliminary answer to this question based on a multi-level network study of the top ‘elites’ in French cancer research during 1996-1998. By multi-level we mean that we reconstituted both the inter-organizational networks of exchange between most French laboratories carrying out cancer research in 1999, simultaneously, we reconstituted key social networks of the top individual elites in cancer research in France during that same year. Given our ‘linked design’ (i.e., knowing to which laboratory each researcher belongs), we were able to disentangle the effects of structural properties of the laboratory front the effects of characteristics of the individual researcher (including structural ones) on the latter’s performance. Performance was measured by a score based on the impact factor of the journal in which each researcher published. Our results show that organizational social capital matters more, and more consistently, than individual relational capital in explaining variations in performance by French top cancer researchers.

Keywords: Productivity, Science

? Buela-Casal, G., Perakakis, P., Taylor, M. and Checa, P. (2006), Measuring internationality: Reflections and perspectives on academic journals. *Scientometrics*, **67** (1), 45-65.

Full Text: [2006\Scientometrics67, 45.pdf](2006/Scientometrics67,%2045.pdf)

Abstract: Internationality as a concept is being applied ambiguously, particularly in the world of academic journal publication. Although different criteria are used by scientometrists in order to measure internationality and to supplement its minimal literal meaning, the present study suggests that no single criterion alone is sufficient. This paper surveys, critically-assesses and extends the existing measures of internationality in the context of academic publishing and identifies those criteria that are most clearly resolved and amenable to quantitative analysis. When applied, however, to a case study of four thematically-connected journals from the field of Health and Clinical Psychology using descriptive statistics and the Gini Coefficient, the measurement of internationality using these criteria was found to be ambiguous. We conclude that internationality is best viewed as a mathematically fuzzy entity and that a single measure Internationality Index, constructed from a combination of suitably weighted criteria, is the only way to unambiguously quantify the degree of internationality.

Keywords: Bibliometric Analysis, Citations, Impact Factor, Patterns, Psychology Journals, Publication, Research Collaboration, Scientific Journals, Spanish, Universities

? Glänzel, W., Leta, J. and Thijs, B. (2006), Science in Brazil. Part 1: A macro-level comparative study. *Scientometrics*, **67** (1), 67-86.

Full Text: [2006\Scientometrics67, 67.pdf](2006/Scientometrics67,%2067.pdf)

Abstract: In the present paper, the evolution of publication activity and citation impact in Brazil is studied for the period 1991-2003. Besides the analysis of trends in publication and citation patterns and of national publication profiles, an attempt is made to find statistical evidences of the relation between international co-authorship and both research profile and citation impact in the Latin American region. Despite similarities and strong co-publication links with the other countries in the region, Brazil has nonetheless a specific research profile, and forms the largest potential in the region.

Keywords: Author Self-Citations, British Science, Collaboration, Countries, Decline, Fields, Indicators, Visibility

? Leta, J., Glänzel, W. and Thijs, B. (2006), Science in Brazil. Part 2: Sectoral and institutional research profiles. *Scientometrics*, **67** (1), 87-105.

Full Text: [2006\Scientometrics67, 87.pdf](2006/Scientometrics67,%2087.pdf)

Abstract: In the present study a bibliometric meso-level analysis of Brazilian scientific research is conducted. Both sectoral and publication profile of Brazilian universities and research institutions are studied. Publication dynamics and changing profiles allow to the conclusion that powerful growth of science in Brazil goes with striking structural changes. By contrast, citation-based indicators reflect less spectacular developments.

Keywords: Industry-Government Relations

? Izsak, J. (2006), Some practical aspects of fitting and testing the Zipf-Mandelbrot model - A short essay. *Scientometrics*, **67** (1), 107-120.

Full Text: [2006\Scientometrics67, 107.pdf](2006/Scientometrics67,%20107.pdf)

Abstract: The standardization of distribution fitting procedures is recommended also in informetrics. We examined the possibility of that standardization when fitting the Zipf-Mandelbrot (ZM) distribution. After propositions of possible steps of standardization, we stress the unique role of maximum likelihood estimates concerning the chi-square goodness-of-fit tests. We touch upon the possible correlation between the parameters of the ZM distribution. A numerical example demonstrates the method and the results.

Keywords: Distributions, Diversity, Laws, Maximum-Likelihood, Species Abundance

? Hemlin, S. (2006), Creative knowledge environments for research groups in biotechnology. The influence of leadership and organizational support in universities and business companies. *Scientometrics*, **67** (1), 121-142.

Full Text: [2006\Scientometrics67, 121.pdf](2006/Scientometrics67,%20121.pdf)

Abstract: This study analysed how leadership and organizational support (LOS) influences creative knowledge environments for research groups in biotechnology. A questionnaire distributed to 90 (97% responding) university and business company researchers resulted in that leadership was rated higher than organizational support. First, leaders were more important to creativity than organizational support. Secondly, LOS differed to a limited extent between members and leaders, universities and business companies and excellent and less excellent groups. Thirdly. working freedom was rated higher in universities than in business companies. Fourthly, group members perceived they were more encouraged to think freely in comparison to their group leaders. Finally, innovation goals were more pronounced in excellent than less excellent groups.

Keywords: Group Innovation, Team Climate Inventory

? Schildt, H.A. and Mattsson, J.T. (2006), A dense network sub-grouping algorithm for co-citation analysis and its implementation in the software tool Sitkis. *Scientometrics*, **67** (1), 143-163.

Full Text: [2006\Scientometrics67, 143.pdf](2006/Scientometrics67,%20143.pdf)

Abstract: Clustering algorithms are used prominently in co-citation analysis by analysts aiming to reveal research streams within a field. However, clustering of widely cited articles is not robust to small variations in citation patterns. We propose an alternative algorithm, dense network sub-grouping, which identifies dense groups of co-cited references. We demonstrate the algorithm using a data set from the field of family business research and compare it to two alternative methods, multidimensional scaling and clustering. We also introduce a free software tool, Sitkis. that implements the algorithm and other common bibliometric methods. The software identifies journal-, country- and university-specific citation patterns and co-citation groups, enabling the identification of ‘invisible colleges.’.

Keywords: Articles, Bibliometrics, Economics, Entrepreneurship, Indicators, Journals, Scholars, Science, Strategic Management Research, Word Analysis

? Rousseau, R. (2006), Measurement and statistics on science and technology. 1920 to the present. *Scientometrics*, **67** (1), 165-166

Full Text: [2006\Scientometrics67, 165.pdf](2006/Scientometrics67,%20165.pdf)

? Rousseau, R. and Rousseau, S. (2006), Remarks concerning the Liberman-Wolf bonding number. *Scientometrics*, **67** (2), 167-173.

Full Text: [2006\Scientometrics67, 167.pdf](2006/Scientometrics67,%20167.pdf)

Abstract: The Libernian-Wolf bonding number can not be considered as an acceptable measure for the internal bonding of a research group or community. This is shown by a construction where adding the same number of articles with the same number of co-authors to two existing groups (with a given number of articles with one or two collaborators) reverses the original order in these groups’ bonding numbers.

Keywords: Collaboration

? Dang, Y. (2006), Fluctuation analysis of discipline development based on impact factor. *Scientometrics*, **67** (2), 175-186.

Full Text: [2006\Scientometrics67, 175.pdf](2006/Scientometrics67,%20175.pdf)

Abstract: Based on the impact factors of the journals recorded by JCR from 1998 to 2003, this paper established the fluctuation model for discipline development. According to the Fluctuation Strength Coefficient, then we gave analysis and evaluation of developing trends of the disciplines in recent years.

? Melo, A.S., Bini, L.M. and Carvalho, P. (2006), Brazilian articles in international journals on limnology. *Scientometrics*, **67** (2), 187-199.

Full Text: [2006\Scientometrics67, 187.pdf](2006/Scientometrics67,%20187.pdf)

Abstract: We assessed the contribution of Brazilian limnologists (freshwater ecologists) in international journals in the period 1970-2004. Brazilian contribution was low and regular in the 1970’s, but increased steeply after 1980 with no signs of stabilization until the present. Articles authored by Brazilians tend to be less cited than articles authored by non-Brazilians, although this difference is reduced in co-authored articles with international researchers. Brazilian articles are not distributed homogenously among the sub-areas of Limnology, but present some biases that can be explained by intellectual legacy. Brazil has invested since the 1970’s in establishing postgraduate courses in Brazil and in the last years has turned the focus to a better qualification of these courses. We believe these are the main reasons for the conspicuous development of Brazilian Limnology.

Keywords: Human-Resources, Impact, Period, Publications, Science

? Yu, G., Guo, R. and Yu, D.R. (2006), The influence of the publication delay on journal rankings according to the impact factor. *Scientometrics*, **67** (2), 201-211.

Full Text: [2006\Scientometrics67, 201.pdf](2006/Scientometrics67,%20201.pdf)

Abstract: The inter-citation journal group is defined as a group of journals with inter-citation relations. In this paper, according to the 2003 JCR, an inter-citation relation matrix of 10 medical journals is established. Based on the transfer function model of the disturbed citing process, the calculation formula of journal impact factor disturbed by publication delays of certain journal in the group is deduced and a changing process of every journal’s impact factor caused by the increase of each journal’s average publication delay is simulated. In the inter-citation journal group, when a journal’s publication delay increase, impact factors of all journals will be decreased and rankings of journals according to the impact factor may be changed. The closer a citation relation between two journals, the stronger the interaction of them and the larger the decrease of their impact factors caused by the increase of their publication delays.

Keywords: Literature Publishing Process

? García-Aracil, A., Gracia, A.G. and Pérez-Marín, M. (2006), Analysis of the evaluation process of the research performance: An empirical case. *Scientometrics*, **67** (2), 213-230.

Full Text: [2006\Scientometrics67, 213.pdf](2006/Scientometrics67,%20213.pdf)

Abstract: In this paper we analyze the objectivity of the peer review process of research performance by research groups in the scientific and technological Valencian system, over the period 1998-2002. For that purpose, we use qualitative and quantitative indicators to assess which of them are the most important to determine a research group as excellent one, based on peer review evaluation methodology. The results show that excellence appears to be driven only by publications in SCI, SSCI and the number of sexenios, and suggest that the peer review process is not as objective as we expected.

Keywords: Academic Research, Impact, Innovation, Knowledge, Research Assessment Exercise, Research Productivity, Science, Scientific Excellence, System, UK

? Leydesdorff, L. and Hellsten, I. (2006), Measuring the meaning of words in contexts: An automated analysis of controversies about ‘Monarch butterflies,’ ‘Frankenfoods,’ and ‘stem cells’. *Scientometrics*, **67** (2), 231-258.

Full Text: [2006\Scientometrics67, 231.pdf](2006/Scientometrics67,%20231.pdf)

Abstract: Co-words have been considered as carriers of meaning across different domains in studies of science, technology, and society. Words and co-words, however, obtain meaning in sentences, and sentences obtain meaning in their contexts of use. At the science, society interface, words can be expected to have different meanings: the codes of communication that provide meaning to words differ on the varying sides of the interface. Furthermore, meanings and interfaces may change over time. Given this structuring of meaning across interfaces and over time, we distinguish between metaphors and diaphors as reflexive mechanisms that facilitate the translation between contexts. Our empirical focus is on three recent scientific controversies: Monarch butterflies, Frankenfoods, and stem-cell therapies. This study explores new avenues that relate the study of co-word analysis in context with the sociological quest for the analysis and processing of meaning.

Keywords: Chemistry, Co-Words, Dynamics, Indicators, Knowledge, Metaphors, Model, Networks, Science, Similarity Measures

? Glänzel, W., Debackere, K., Thijs, B. and Schubert, A. (2006), A concise review on the role of author self-citations in information science, bibliometrics and science policy. *Scientometrics*, **67** (2), 263-277.

Full Text: [2006\Scientometrics67, 263.pdf](2006/Scientometrics67,%20263.pdf)

Abstract: The objective of the present study is twofold: (I) to show the aims and means of quantitative interpretation of bibliographic features in bibliometrics and their re-interpretation in research policy, and (2) to summarise the state-of-art in self-citation research. The authors describe three approaches to the role of author self-citations and possible conflicts arising from the different perspectives. From the bibliometric viewpoint we can conclude that that there is no reason for condemning self-citations in general or for removing them from macro or meso statistics, supplementary indicators based on self-citations are, nonetheless, useful to understand communication patterns.

Keywords: Indicators, Macro, Scientific Literature

? Nelson, M.J. (2006), Visualization of citation patterns of some Canadian journals. *Scientometrics*, **67** (2), 279-289.

Full Text: [2006\Scientometrics67, 279.pdf](2006/Scientometrics67,%20279.pdf)

Abstract: In order to easily see the citation patterns of a journal or subject area it is very useful to use a graphical diagram to visualize all the connections between journals. Using data derived from the Journal Citation Reports, this study investigates the visualization of citation patterns for three Canadian journals in three different subject areas: library and information science, psychology and mathematics.

? Vaughan, L., Gao, Y.J. and Kipp, M. (2006), Why are hyperlinks to business Websites created? A content analysis. *Scientometrics*, **67** (2), 291-300.

Full Text: [2006\Scientometrics67, 291.pdf](2006/Scientometrics67,%20291.pdf)

Abstract: Motivations for the creation of hyperlinks to business sites were analyzed through a content analysis approach. Links to 280 North American IT companies (71 Canadian companies and 209 U.S. companies) were searched through Yahoo!. Then a random sample of 808 links was taken from the links retrieved. The content as well as the context of each link was manually examined to determine why the link was created. The country location and the type of the site where the link came from were also identified. The study found that most links were created for business purposes confirming findings from early quantitative studies that links contain useful business information. Links to competitors were extremely rare but competitors were often co-linked, suggesting that co-link analysis is the direction to pursue for information on competitive intelligence.

Keywords: Impact, Information, Links, Web

? Wolfram, D. (2006), Applications of SQL for informetric frequency distribution processing. *Scientometrics*, **67** (2), 301-313.

Full Text: [2006\Scientometrics67, 301.pdf](2006/Scientometrics67,%20301.pdf)

Abstract: Many informetric data types lend themselves to ready adaptation to relational DBMS environments for storage and processing. SQL, the standard language used for constructing and querying relational databases, provides useful tools for processing informetric data. The author demonstrates the applications and some limitations of SQL for efficient organization and tabulation of raw informetric data.

? Glänzel, W. (2006), On the h-index - A mathematical approach to a new measure of publication activity and citation impact. *Scientometrics*, **67** (2), 315-321

Full Text: [2006\Scientometrics67, 315.pdf](2006/Scientometrics67,%20315.pdf)

Keywords: Citation, h Index, h-Index, Impact, Publication, Publication Activity, Ranking, Scientists

? Burrell, Q.L. (2006), The use of Lotka functions and systematic sampling. *Scientometrics*, **67** (2), 323-325

Full Text: [2006\Scientometrics67, 323.pdf](2006/Scientometrics67,%20323.pdf)

Keywords: Law

? Suárez-Balseiro, C., Sanz-Casado, E. and Ortiz-Rivera, L. (2006), Patterns of international scientific co-operation in Puerto Rico. *Scientometrics*, **67** (3), 335-350.

Abstract: Scientific activity has been increasing in Puerto Rico in recent years, a development mirrored not only by the amount of papers published, but by the international links established for scientific co-operation. The purpose of the present study is to identify and discuss the patterns of such cooperation, along with the trends in scientific research conducted in that context at Puerto Rican institutions. The methodology includes an analysis of the main areas of research addressed, defined as the area of specialization of the journals publishing papers indexed in the Science Citation Index (CD-ROM version) from 1980 to 1999. A total of 7271 studies, appearing ill 1240 scientific journals, were selected to study the co-operation established between Puerto Rican institutions and organizations in other countries. The findings showed a high rate of international co-operation: 46.07% of the papers published were co-authored by researchers from other countries. The country accounting for the highest percentage of joint research was the USA, followed by Germany, United Kingdom, Canada and Italy. The close relationship between the Puerto Rican and US scientific systems is not unusual, inasmuch as the economic and sociopolitical bonds between them play an essential role in Puerto Rican scientific activity. The results also revealed substantial differences between the nineteen eighties and the nineties in terms, of the nature of the links established, as well as growing internationalization of scientific research conducted on the island over the twenty-year period studied.

Keywords: Co-Authorship, Journals, Link Indicator, Profiles, Research Collaboration, Science, Small Country, Time

? Wetterer, J.K. (2006), Quotation error, citation copying, and ant extinctions in Madeira. *Scientometrics*, **67** (3), 351-372.

Full Text: [2006\Scientometrics67, 351.pdf](2006/Scientometrics67,%20351.pdf)

Abstract: Many authors have written about how exotic ants invaded the Atlantic islands of Madeira and negatively impacted or even completely exterminated its native ants, despite the lack of first hand observations concerning such impact. I examine how quotation error (misrepresentation of previous work) and citation copying (citing unexamined publications referred to by others) led to the origin and spread of the erroneous story of ant extinctions in Madeira. Quotation error and citation copying may be more common than most scientists realize, particularly when authors cite references that are written in languages they do not understand.

Keywords: Argentine, Articles, Authors, Citation, Error, First, Formicidae, Hymenoptera, Impact, Iridomyrmex-Humilis, Island, Languages, Origin, Ortega-Hypothesis, Pheidole-Megacephala, Publications, Quotation, Quotation Error, References, Work

? Thelwall, M., Barjak, F. and Kretschmer, H. (2006), Web links and gender in science: An exploratory analysis. *Scientometrics*, **67** (3), 373-383.

Full Text: [2006\Scientometrics67, 373.pdf](2006/Scientometrics67,%20373.pdf)

Abstract: Gender inequalities are prevalent in science despite many initiatives to try to eradicate them. Given the deep-rooted and complex nature of these inequalities there is a continuing need for research into their causes and manifestations. This study analyses one aspect of web communication, hyperlinks, to explore whether they are a potential source of insights into gender differences in this important scientific communication medium. A study of links to life sciences research groups in nine European found little evidence of gender differences, except in Germany. As a consequence, it is argued that hyperlinks are not a promising source of quantitative information about gender differences in communication strategies or online visibility, at least for senior researchers or research groups.

Keywords: Computer-Mediated Communication, Impact Factors, Scientists, Site Interlinking, Women

? Robert, C., Wilson, C.S., Gaudy, J.F. and Arreto, C.D. (2006), A snapshot of EU publications in sleep research: A scientometric survey. *Scientometrics*, **67** (3), 385-405.

Full Text: [2006\Scientometrics67, 385.pdf](2006/Scientometrics67,%20385.pdf)

Abstract: A bibliometric analysis of the literature covering a one-year period (2003) was performed it) evaluate the number of scientific publications on sleep and its distribution among the European Union countries. 912 articles appearing in Life Sciences and Clinical Medicine journals indexed in the Institute for Scientific Information databases were downloaded. These articles were authored by EU researchers, Germany, the United Kingdom, France, and Italy rank at the top of the EU countries. The output distribution of the most productive EU countries are also presented and discussed. Despite the limitations of the methods used, the present results give all interesting snapshot of the EU publishing behavior in sleep research.

Keywords: Adults, Consequences, European-Union, Journals

? Rivellini, G., Rizzi, E. and Zaccarin, S. (2006), The science network in Italian population research: An analysis according to the social network perspective. *Scientometrics*, **67** (3), 407-418.

Full Text: [2006\Scientometrics67, 407.pdf](2006/Scientometrics67,%20407.pdf)

Abstract: The scientific community organises its relationships into network patterns, where the nodes are individuals (scientists) and the links are acquaintance and common work, usually presented at workshops and conferences and, or published in books and scientific journals. A references review on Population Studies by Italian scientists is delivered every two years by the Demography Section of the Italian Statistical Society, the review is exhaustive for academic demographers. In this paper, the properties of the demographers’ network in 1998-1999 are evaluated. with the aim of identifying factors which may influence collaborative relations among actors. The probability of cooperation between couples (dyads) of demographers is modelled, conditionally oil observed characteristics of the dyad (sex, academic position, university affiliation). Main results suggest that ‘closeness’, defined in a wider sense and not simply as geographical proximity, plays a major role in determining actors’ relationships.

Keywords: Patterns

? Huang, M.H., Chang, H.W. and Chen, D.Z. (2006), Research evaluation of research-oriented universities in Taiwan from 1993 to 2003. *Scientometrics*, **67** (3), 419-435.

Full Text: [2006\Scientometrics67, 419.pdf](2006/Scientometrics67,%20419.pdf)

Abstract: Publications have been regarded as the most significant output indicating the research performance of universities. This paper uses ISI Essential Science Indicators (ESI) database to investigate the academic performance of research-oriented universities in Taiwan, adopting the bibliometric method from both quantitative and qualitative perspectives. The data cover the time span for 11 years from 1993 to 2003. The performance indicators applied in this study includes the number of papers, the number of citations, the average citations per paper, the number of highly cited papers, the number of hot papers, and the number of top papers. The research performance and the strength of those universities are revealed in this study, and it is found that National Taiwan University leads among these universities though each university still shows strengths in various specific fields.

Keywords: Bibliometric Methods, Departments Research, Highly Cited Papers, Indicators, Publications, Research Performance

? Atallah, G. and Rodriguez, G. (2006), Indirect patent citations. *Scientometrics*, **67** (3), 437-465.

Full Text: [2006\Scientometrics67, 437.pdf](2006/Scientometrics67,%20437.pdf)

Abstract: Patent citations are extensively used as a measure of patent quality. However, counting citations does not account for the fact that citations come from patents of different qualities, and that citations are of variable qualities. We develop a citation index which takes into account the cumulative quality of the citing patents. We apply this index to the 2,139,314 utility patents granted in the U.S. between 1975 and 1999. We study the properties of this index by year and by technological category, and analyse the links between patents.

Keywords: Indicators, Maximum-Likelihood Methods, Models

? Kumari, L. (2006), Trends in synthetic organic chemistry research. Cross-country comparison of Activity Index. *Scientometrics*, **67** (3), 467-476.

Full Text: [2006\Scientometrics67, 467.pdf](2006/Scientometrics67,%20467.pdf)

Abstract: Chemistry is accepted as the central science since it encompasses the great divide between Physics and Biology with linkages to many othert disciplines. But recent emergence of other interdisciplinary sciences likes biomedicine, molecular biology, biotechnology etc. are overshadowing chemical research. Still one of the subfields of chemistry, Synthetic Organic Chemistry (SOC) retained its importance as it is a part of new drug discovery and is the basis of bulk of chemical industry. Scientometric evaluation of world’s research output in Synthetic Organic Chemistry has been quantified for two periods spans 1989-1993 and 1998-2003. The global trends in publication output are mapped and a cross-country comparison of the relative activity in the subspecialty is examined. The Activity Index trend reveals that though quantitatively USA, Japan and European nations produce more publications, their Activity Index recorded a declining trend and leads to the conclusion that these nations are shifting their interest towards other emerging specialties. Asian countries, having recorded a linear increase in tile Activity Index show that synthetic organic chemistry is still their priority.

Keywords: Indicators, Physics, Universities

? Patra, S.K. and Mishra, S. (2006), Bibliometric study of bioinformatics literature. *Scientometrics*, **67** (3), 477-489.

Full Text: [2006\Scientometrics67, 477.pdf](2006/Scientometrics67,%20477.pdf)

Abstract: Bioinformatics is a multidisciplinary and comparatively new area of science that has made a significant impact within a short period. A systematic analysis of the rise in bioinformatics literature is, however, not available. This study analyses the growth of the scientific literature in this area as available from NCBI PubMed using standard bibliometric techniques. Bradford’s law of scattering was used to identify core journals and Lotka’s law employed to analyze author’s productivity pattern. Study also explored publication type, language and the Country of publication. Twenty core journals were identified and the primary mode of dissemination of information was through journal articles. Authors with single publication were more predominant (73.58%) contrary to that predicted by Lotka’s law. The study provides useful information to scientists wishing to undertake work in this area.

Keywords: Lotkas Law, Science, Scientific Productivity

Notes: highly cited

? Van Raan, A.F.J. (2006), Comparison of the Hirsch-index with standard bibliometric indicators and with peer judgment for 147 chemistry research groups. *Scientometrics*, **67** (3), 491-502.

Full Text: [2006\Scientometrics67, 491.pdf](2006/Scientometrics67,%20491.pdf)

Abstract: In this paper we present characteristics of the statistical correlation between the Hirsch (h-) index and several standard bibliometric indicators, as well as with the results of peer review judgment. We use the results of a large evaluation study of 147 university chemistry research groups in the Netherlands covering the work of about 700 senior researchers during the period 1991-2000. Thus, we deal with research groups rather than individual scientists, as we consider the research group as the most important work floor unit in research, particularly in the natural sciences. Furthermore, we restrict the citation period to a three-year window instead of ‘life time counts’ in order to focus on the impact of recent work and thus on current research performance. Results show that the h-index and our bibliometric ‘crown indicator’ both relate in a quite comparable way with peer judgments. But for smaller groups in fields with ‘less heavy citation traffic’ the crown indicator appears to be a more appropriate measure of research performance.

Keywords: Bibliometric, Bibliometric Indicators, Characteristics, Chemistry, Citation, Evaluation, h Index, h-Index, Hirsch, Hirsch Index, Impact, Indicator, Indicators, Life, Peer Review, Peer-Review, Ranking, Research, Research Performance, Review, Sciences, Scientists, Standard, The Netherlands, Traffic, University, Work

? Schubert, A., Glänzel, W. and Thijs, B. (2006), The weight of author self-citations. A fractional approach to self-citation counting. *Scientometrics*, **67** (3), 503-514.

Full Text: [2006\Scientometrics67, 503.pdf](2006/Scientometrics67,%20503.pdf)

Abstract: The discussion about how to treat author self-citations driven by policy application and quality measurement intensified in the last years. The definition introduced by Snyder and Bonzi has - in lack of any reasonable alternative - been used in bibliometric practice for science policy purposes. This method, however, does not take into account the weight of self-citing authors among coauthors of both the cited and citing papers. The objective of the present paper is to quantify the weight of self-citations with respect to co-authorship. The analysis is conducted at two levels: at the macro level, namely, for fifteen subject fields and the most active forty countries, and at the meso level, for a set of selected research institutions.

Keywords: Science

? Mika, P., Elfring, T. and Groenewegen, P. (2006), Application of semantic technology for social network analysis in the sciences. *Scientometrics*, **68** (1), 3-27.

Full Text: [2006\Scientometrics68, 3.pdf](2006/Scientometrics68,%203.pdf)

Abstract: The use of electronic data is steadily gaining ground in the study of the social organization of scientific and research communities, decreasing the researcher’s reliance on commercial databases of bibliographic entries, patents grants and other manually constructed records of scientific works. In our work we provide a methodological innovation based on semantic technology for dealing with heterogeneity in electronic data sources. We demonstrate the use of our electronic system for data collection and aggregation through a study of the Semantic Web research community. Using methods of network analysis, we confirm the effect of Structural Holes and provide novel explanations of scientific performance based on cognitive diversity in social networks.

Keywords: Aggregation, Analysis, Collaboration, Communities, Community, Data Collection, Diversity, Heterogeneity, Network, Network Analysis, Organization, Performance, Research, Social Network, Social Networks, Web

? Gupta, V.K. (2006), References to literature in patent documents: A case study of CSIR in India. *Scientometrics*, **68** (1), 29-40.

Full Text: [2006\Scientometrics68, 29.pdf](2006/Scientometrics68,%2029.pdf)

Abstract: The paper examines the use of references by applicants and the examiners in US patent documents by R&D scientists from CSIR in India. It observes that scientists in CSIR use higher inputs of scientific information than the technical information in patenting. The examiners do make their own prior art search and add significantly to the patent and non-patent literature, which is distinctly different from the references given by the R&D scientists from CSIR. It identifies (a) the major disciplines and the sub-disciplines that contribute most of the scientific knowledge, and (b) the countries from where most references to patent literature are made. The applicants cite relatively less recent patent literature and more medium-term patent literature in comparison to citations by examiners. The paper observes that there is scope of improvement in making relevant prior art search, particularly, for patent literature by R&D scientists and in planning and organizing the information support for conducting patentable R&D in CSIR.

Keywords: India, Knowledge, Linkage, Literature, Planning, Recent, Science, Technology, US

? Cozzarin, B.P. (2006), Performance measures for the socio-economic impact of government spending on R&D. *Scientometrics*, **68** (1), 41-71.

Full Text: [2006\Scientometrics68, 41.pdf](2006/Scientometrics68,%2041.pdf)

Abstract: The aims of this paper are to summarize Canadian government programs pertaining to research and development (R&D) and R&D support programs, and to propose a method for analyzing their socio-economic impact. The programs under investigation include: Canada Research Chairs Canada Millennium Scholarship Foundation Canada Foundation for Innovation Technology Partnerships Canada (TPC) Industrial Research Assistance Program (IRAP) Natural Sciences and Engineering Research Council (NSERC) Social Sciences and Humanities Research Council (SSHRC) Canada Institutes of Health Research (CIHR) Canadian Institute of Advanced Research (CIAR) Pre-Competitive Advanced Research Networks (PRECARN) Networks of Centres of Excellence.

Keywords: Basic Research, Canada, Development, Diffusion, Economics, Impact, Innovation, Method, Productivity Increase, Research, Returns, Science, Socioeconomic, Sponsored Research, Technical Change, Technology Policy

? Skilton, P.F. (2006), A comparative study of communal practice: Assessing the effects of taken-for-granted-ness on citation practice in scientific communities. *Scientometrics*, **68** (1), 73-96.

Full Text: [2006\Scientometrics68, 73.pdf](2006/Scientometrics68,%2073.pdf)

Abstract: Building on the findings of recent ethnographic studies of scientific practice, I develop and test theory about the impact of taken-for-granted-ness on citation practice in scientific communities. Using data gathered from special issues of scientific journals I find support for the hypothesized differences in the practices of natural and social science communities. Post hoc analysis uncovers evidence of a third pattern of citation practice associated in part with engineering and technology research, and evidence that organization studies and strategic management communities tend to employ extreme versions of social science citation practices. I discuss the implications of the study for our understanding of communities of practice, for our beliefs about differences between the branches of science, and about science as a productive enterprise.

Keywords: Academic Publication, Advance, Analysis, Barriers, Beliefs, Communities, Effects, Evidence, Impact, Knowledge, Management, Organization, Organizational Science, Pattern, Recent, Research, Theory

? Molatudi, M. and Pouris, A. (2006), Assessing the knowledge base for biotechnology in South Africa: A bibliometric analysis of South African microbiology and molecular biology and genetics research. *Scientometrics*, **68** (1), 97-108.

Full Text: [2006\Scientometrics68, 97.pdf](2006/Scientometrics68,%2097.pdf)

Abstract: We review the knowledge base for biotechnology in South Africa in the light of government interventions aimed at establishing a biotechnology industry. We use bibliometric methods to analyse data from the ISI database on the performance of microbiology, genetics and molecular biology research over a 20-year period from 1980 to 2000. Genetics and molecular biology publications have seen a steady decline while microbiology has steadily increased its share of world publications. Although the quantity of the base is small the relative impact factor suggests that the quality of publications in these disciplines is comparable to world output. We conclude that the lack of adequate output in these disciplines poses a threat to government policies and investment aimed at increasing biotechnology commercialisation.

Keywords: Africa, Analysis, Genetics, Impact, Interventions, Knowledge, Light, Performance, Quality, Research, Review, Science, South Africa

? Godin, B. (2006), On the origins of bibliometrics. *Scientometrics*, **68** (1), 109-133.

Full Text: [2006\Scientometrics68, 109.pdf](2006/Scientometrics68,%20109.pdf)

Abstract: Among the many statistics on science, called scientometrics, bibliometrics holds a privileged place. Bibliometrics is one of the few subfields concerned with measuring the output side of science. According to most ‘histories’, bibliometrics owes its systematic development mainly to D.J.D. Price and Eugene Garfield, as founders. The few works conducted before the 1950s are usually relegated to prehistory. This paper documents how the systematic counting of publications originated with psychologists. In the early 1900s, psychologists began collecting statistics on their discipline. Publications came to be counted in addresses, reviews and histories of psychology for several decades. The aim was to contribute to the advancement of psychology. Far from being a negligible output of a prehistoric type, both the volume and the systematicness of these efforts are witnesses to what should be considered as pioneering work, and their authors considered as forerunners to bibliometrics.

Keywords: Age, American-Psychological-Association, Articles, Development, Different Languages, Number, Performance, Psychology, Science, Scientific Productivity, Statistics, United-States, Vital-Statistics

? Cheng, Y. and Liu, N.C. (2006), A first approach to the classification of the top 500 world universities by their disciplinary characteristics using scientometrics. *Scientometrics*, **68** (1), 135-150.

Full Text: [2006\Scientometrics68, 135.pdf](2006/Scientometrics68,%20135.pdf)

Abstract: In this study, the top 500 world universities are classified into 21 types according to their disciplinary characteristics using clustering method. The indicators used to represent the disciplinary characteristics of an institution are the proportion of publications in six broader disciplinary areas: Arts/Humanities & Social Sciences, Natural Sciences & Mathematics, Engineering/Technology & Computer Sciences, Life Sciences, Clinical Medicine, and Interdisciplinary & Multidisciplinary Sciences. Institutions have been classified into types of having focus in a disciplinary group, having priority in a disciplinary group, having orientation in a disciplinary group, and balanced. The distribution of different types of institutions with respect to countries and ranks are analyzed.

Keywords: Classification, Clustering, Distribution, Indicators, Method

? Garg, K.C., Kumar, S. and Lal, K. (2006), Scientometric profile of Indian agricultural research as seen through Science Citation Index Expanded. *Scientometrics*, **68** (1), 151-166.

Full Text: [2006\Scientometrics68, 151.pdf](2006/Scientometrics68,%20151.pdf)

Abstract: An analysis of 16891 publications published by Indian scientists during 1993-2002 and indexed by Science Citation Index Expanded (Web of Science) indicates that the publication output in the agricultural sciences is on the decline since 1998 onwards. ‘Dairy and animal sciences’ followed by ‘veterinary sciences’ constitute the largest component of the Indian agricultural research output. Agricultural universities and institutes under the aegis of Indian Council of Agricultural Research (ICAR) are the major producers of research output. Most of the papers have been published in domestic journals and in low normalized impact factor journals with a low rate of citation per paper. Most of the highly productive institutions are either agricultural universities or the institutes under the aegis of ICAR. Most of the prolific authors are from the highly productive institutions. However, only a few highly cited authors are from highly productive institutions.

Keywords: Analysis, Impact, Research

? Liu, Y., Cheng, G.P. and Yang, Y. (2006), Patent applications of the top 500 foreign investment corporations in China. *Scientometrics*, **68** (1), 167-177.

Full Text: [2006\Scientometrics68, 167.pdf](2006/Scientometrics68,%20167.pdf)

Abstract: The paper focuses on the top 500 foreign investment corporations (FICs) in China, by conducting data mining and system searching on the data-base of patent from the State Intellectual Property Office of the People’s Republic of China (SIPO). Structure of patent applications, industrial distribution of patent applications, monopolistic tendency, technological innovation of Chinese companies and directions of foreign investment are studied.

Keywords: China, Chinese, Corporations, Distribution, Mining

? Batista, P.D., Campiteli, M.G., Kinouchi, O. and Martinez, A.S. (2006), Is it possible to compare researchers with different scientific interests? *Scientometrics*, **68** (1), 179-189.

Full Text: [2006\Scientometrics68, 179.pdf](2006/Scientometrics68,%20179.pdf)

Abstract: The number h of papers with at least h citations has been proposed to evaluate individuals scientific research production. This index is robust in several ways but yet strongly dependent on the research field. We propose a complementary index h(t) =h(2)/N-a((T)), with N-a((T)) being the total number of authors in the considered h papers. A researcher with index h, has h, papers with at least ht citation if he/she had published alone. We have obtained the rank plots of h and ht for four Brazilian scientific communities. In contrast with the h-index, the ht index rank plots collapse into a single curve allowing comparison among different research areas.

Keywords: Citation, Citations, Comparison, Complementary, h Index, h-Index, Index, Index h, Papers, Rank, Ranking, Research, Scientific Research

? Okubo, Y. and Yamashita, Y. (2006), Scientometrics research in Japan - Introduction. *Scientometrics*, **68** (2), 193-202.

Full Text: [2006\Scientometrics68, 193.pdf](2006/Scientometrics68,%20193.pdf)

Keywords: Bibliometrics, Japan, Research

? Fujigaki, Y. (2006), Changes in the research stream by standardization: A content analysis of the Archives of General Psychiatry during the establishment of operational diagnostic criteria. *Scientometrics*, **68** (2), 203-212.

Full Text: [2006\Scientometrics68, 203.pdf](2006/Scientometrics68,%20203.pdf)

Abstract: Universality through standardization is at the heart of scientific and medical practices. In this study we dealt with the meaning, significance, and implications of standardization through ‘operationalization’ in psychiatric diagnostic criteria by focusing on the effects of the DSM (Diagnostic Statistical Manual) M. What does ‘operational’ mean?\* The discussion of ‘operationalization’ in psychiatric diagnosis poses quite a challenge. Given the importance of semantics and the word networks of everyday life in forming descriptions of symptoms and reaching clinical judgments, cultural differences in these semantics inevitably have strong impacts on psychiatric diagnosis. The link between sensitivity and semantics in words enhances this effect. In spite of the difficulties in approaching operationalization in psychiatric diagnosis, several attempts have been made to standardize diagnostic criteria. Prominent examples include the DSM of the American Psychiatric Association and the ICD (International Disease Classification) of the WHO. In this paper we analyzed the effects of standardized diagnostic criteria by performing a content analysis of papers published in the Archives of General Psychiatry from 1978 to 1990. Our results clearly show changes in the research questions, research designs, methodologies, target diseases, and selections of independent and dependent variables.

Keywords: American, Analysis, Citation, Clinical, Diagnosis, Diagnostic Criteria, Effects, Epidemiology, Heart, Impacts, Knowledge, Link, Medical, Networks, Psychiatric, Research, Sensitivity, Standardization, Stream, System

? Fujimaki, K. and Haklak, R. (2006), Quantitative evaluation of positive or negative feelings for biotechnology- or health-related scenes in movies. *Scientometrics*, **68** (2), 213-226.

Full Text: [2006\Scientometrics68, 213.pdf](2006/Scientometrics68,%20213.pdf)

Abstract: Public attitude toward biotechnology- and health-related scenes in movies influences the development of the biomedical science itself and thereafter of our health- and technology-conscious society. We have developed a new quantitative indicator to evaluate positive and negative feelings toward such scenes. Thirty movies including nine biotechnology-related, twenty health-related, and one both-related movies were evaluated into 0 (0%) highly negative, 10 (33%) negative, 17 (57%) neutral, 3 (10%) positive, and 0 (0%) highly positive feeling movies. Biotechnology-related movies were negative, while health-related movies were neutral. This indicator is useful for rating the perception of biotechnology and health in movies.

Keywords: Attitude, Development, Evaluation, Film, Health, Indicator, Journalists, News, Perception, Portrayal, Science, Scientists, Smoking

? Furukawa, R. and Goto, A. (2006), Core scientists and innovation in Japanese electronics companies. *Scientometrics*, **68** (2), 227-240.

Full Text: [2006\Scientometrics68, 227.pdf](2006/Scientometrics68,%20227.pdf)

Abstract: In this paper we examine the role of what we call core scientists in innovation in Japanese electronics companies. Core scientists are those who have the top total scores as measured by the number of their publications and citations received. We find that even though they may not apply for a large number of patents themselves, the scientific knowledge of the core scientists may have a positive effect in stimulating patent applications by their collaborators.

Keywords: Basic Research, Communication, Firms, Knowledge, Patterns, Performance, R-and-D

? Hayashi, T. and Tomizawa, H. (2006), Restructuring the Japanese national research system and its effect on performance. *Scientometrics*, **68** (2), 241-264.

Abstract: The Japanese government has been attempting to reform the national research system for the past 20 years. This paper describes the structural changes of the system and its performance based on bibliometric analyses and discusses the effects of S&T policy. The investigation indicates that although Japan gradually increased its production of highly cited publications, its share of low-cited publications is much higher than the former. Detailed analyses reveal that the top eight universities account for half of the highly cited publications in the university sector, while other hundreds of universities have massively increased their low-cited publications since 1990. The development of financial and human resources for research in the 1990s enabled new actors to be involved in scientific research, but the resources were concentrated to a small number of universities, reinforcing the collaboration between these universities and others.

Keywords: Collaboration, Development, Effects, Human, Japan, Performance, Policy, Production, Reform, Research, University

? Suzuki, J., Gemba, K., Tamada, S., Yasaki, Y. and Goto, A. (2006), Analysis of propensity to patent and science-dependence of large Japanese manufacturers of electrical machinery. *Scientometrics*, **68** (2), 265-288.

Full Text: [2006\Scientometrics68, 265.pdf](2006/Scientometrics68,%20265.pdf)

Abstract: The paper aims to clarify the extent to which the results of scientific-oriented research conducted by corporations are reflected in their application-oriented research. Focusing on large Japanese manufacturers of electrical machinery, the paper analyses firm-level data on presentations of scientific papers that represent the results of scientific-oriented research activities, citations of scientific papers in patents, and inventions. The electrical machinery industry, a prototypical science-based industry, has been placing a growing emphasis on scientific-oriented research during the 1990’s as is evident from trends in R&D expenses, scientific papers, and inventions. Regression analysis results suggest a complementary relationship between citations of basic scientific knowledge as presented in scientific papers on the one hand and acts of invention on the other hand, in the sense that a rise in citations corresponds to a rise in inventions. Moreover, the results suggest that invention efficiency (number of patent claims per unit of R&D expenditure) has been increasing during the 1990’s. Furthermore, the results suggest that, given the exogenous influences on the patent system in Japan, it is necessary to include the number of patent claims when attempting to measure corporate technology development activity through the volume of patent applications. However, there was no finding of a clear relationship between the number of scientific papers and inventions. Implications of these results for corporate R&D strategy are examined.

Keywords: Activity, Analysis, Basic Research, Corporations, Development, Expenditure, Japan, Knowledge, Research, Trends

? Tamada, S., Naito, Y., Kodama, F., Gemba, K. and Suzuki, J. (2006), Significant difference of dependence upon scientific knowledge among different technologies. *Scientometrics*, **68** (2), 289-302.

Full Text: [2006\Scientometrics68, 289.pdf](2006/Scientometrics68,%20289.pdf)

Abstract: The authors have constructed an original database of the full text of the Japanese Patent Gazette published since 1994. The database includes not only the front page but also the body text of more than 880,000 granted Japanese patents. By reading the full texts of all 1,500 patent samples, we found that some inventors cite many academic papers in addition to earlier patents in the body texts of their Japanese patents. Using manually extracted academic paper citations and patent citations as ‘right’ answers, we fine-tuned a search algorithm that automatically retrieves cited scientific papers and patents from the entire texts of all the Japanese patents in the database. An academic paper citation in a patent text indicates that the inventor used scientific knowledge in the cited paper when he/she invented the idea codified in the citing patent. The degree of science linkage, as measured by the number of research papers cited in patent documents, is particularly strong in biotechnology. Among other types of technology, those related to photographic-sensitized material, cryptography, optical computing, and speech recognition also show strong science linkage. This suggests that the degree of dependence on scientific knowledge differs from technology to technology and therefore, different ways of university-industry collaboration are necessary for different technology fields.

Keywords: Algorithm, Collaboration, Dependence, Knowledge, Optical, Research

? Yamashita, Y. and Okubo, Y. (2006), Patterns of scientific collaboration between Japan and France: Inter-sectoral analysis using Probabilistic Partnership Index (PPI). *Scientometrics*, **68** (2), 303-324.

Full Text: [2006\Scientometrics68, 303.pdf](2006/Scientometrics68,%20303.pdf)

Abstract: In this article we present an indicator - Probabilistic Partnership Index (PPI) - for use in measuring scientific linkages. This indicator is based on the Monte-Carlo simulation which provides a standard model to each network established in collaboration between two countries. Any relationship that occurs within a (whole) network can be projected to a standard model respectively and thus PPI is useful in examining individual networks within complex exchanges. We investigate inter-sectoral cooperation between France and Japan for the period of 1981-2004, by classifying every research unit appearing in the data set by its sector. We examine international collaborative patterns, domestic collaborative patterns and multilateral relationships established within the French-Japanese cooperation. We also compare PPI with the classic collaborative linkage indexes - Jaccard Index, Salton-Ochiai Index and Probabilistic Affinity Index - in order to describe the specificity of the new indicator. Our hope is that PPI will prove to be a useful and complementary tool for the analysis of international collaboration.

Keywords: Analysis, Collaboration, Cooperation, Countries, France, Indicator, International, International Collaboration, Japan, Link Indicator, Model, Network, Networks, Profiles, Publications, Research, Science, Simulation, Universities

? Glänzel, W. and Rousseau, R. (2006), Untitled. *Scientometrics*, **68** (3), 327.

Full Text: [2006\Scientometrics68, 327.pdf](2006/Scientometrics68,%20327.pdf)

Archambault, E., Vignola-Gagne, E., Cote, G., Lariviere, V. and Gingras, Y. (2006), Benchmarking scientific output in the social sciences and humanities: The limits of existing databases. *Scientometrics*, **68** (3), 329-342.

Full Text: [2006\Scientometrics68, 329.pdf](2006/Scientometrics68,%20329.pdf)

Abstract: The goal of this paper is to examine the impact of linguistic coverage of databases used by bibliometricians on the capacity to effectively benchmark the work of researchers in social sciences and humanities. We examine the strong link between bibliometrics and the Thomson Scientific’s database and review the differences in the production and diffusion of knowledge in the social sciences and humanities (SSH) and the natural sciences and engineering (NSE). This leads to a re-examination of the debate on the coverage of these databases, more specifically in the SSH. The methods section explains how we have compared the coverage of Thomson Scientific databases in the NSE and SSH to the Ulrich extensive database of journals. Our results show that there is a 20 to 25% overrepresentation of English-language journals in Thomson Scientific’s databases compared to the list of journals presented in Ulrich. This paper concludes that because of this bias, Thomson Scientific databases cannot be used in isolation to benchmark the output of countries in the SSH.

Keywords: Behavioral-Sciences, Capacity, Coverage, Diffusion, Impact, Indicators, Journals, Knowledge, Link, Production, Research Performance, Review, Sociology Citation Index

? Barjak, F. (2006), Research productivity in the internet era. *Scientometrics*, **68** (3), 343-360.

Full Text: [2006\Scientometrics68, 343.pdf](2006/Scientometrics68,%20343.pdf)

Abstract: The present study investigated the relationship between the use of different internet applications and research productivity, controlling for other influences on the latter. The control variables included dummies for country, discipline, gender and type of organization of the respondent, as well as variables for age, recognition, the degree of society-related and career-related motivation for research, and the size of the collaboration network. Simple variance analyses and more complex negative binomial hurdle models point to a positive relationship between internet use (for personal communication, information retrieval and information dissemination) and research productivity. However, the results should be interpreted with caution as it was not possible to test the role of the internet against other pre-internet tools which fulfil the same functions. Thus instance it may not be the use of e-mail per se, but the degree of communicating with colleagues that makes a productive scientist.

Keywords: Age, Collaboration, Communication, Computer-Mediated Communication, Control, Dissemination, Faculty, Gender, Information Dissemination, Internet, Level, Models, Motivation, Network, Organization, Patterns, Point, Productivity, Publication Productivity, Research, Research Performance, Science, Scientific Collaboration, University

? Basu, A. (2006), Using ISI’s ‘Highly Cited Researchers’ to obtain a country level indicator of citation excellence. *Scientometrics*, **68** (3), 361-375.

Full Text: [2006\Scientometrics68, 361.pdf](2006/Scientometrics68,%20361.pdf)

Abstract: A high level of citation to an author’s work is, in general, a testimony to the fact that the author’s work has been noted and used by his peers. High citation is seen to be correlated with other forms of recognition and rewards, and is a key indicator of research performance, among other bibliometric indicators. The Institute for Scientific Information (ISI) defines a ‘highly cited researcher’ (HCR) as one of 250 most cited authors of journal papers in any discipline. Citation data for 20 years (1981-1999) is used to calculate the share of HCRs for countries in 21 subject areas. We find that the US dominates in all subject areas (US share similar to 40-90%). Based on the number of highly cited researchers in a country, an index of citation excellence is proposed. We find that rank order of countries based on this index is in conformity with our general understanding of research excellence, whereas the more frequently used indicator, citations per paper, gave an unacceptable rank order due to an inherent bias toward very small countries. Additionally, a high value of the index of citation excellence was found to be associated with higher concentration of highly cited researchers in affiliating organizations.

Keywords: Concentration, Indicator, Indicators, Inherent, Key, Organizations, Peers, Performance, Research, US

? Van Den Besselaar, P. and Heimeriks, G. (2006), Mapping research topics using word-reference co-occurrences: A method and an exploratory case study. *Scientometrics*, **68** (3), 377-393.

Full Text: [2006\Scientometrics68, 377.pdf](2006/Scientometrics68,%20377.pdf)

Abstract: Mapping of science and technology can be done at different levels of aggregation, using a variety of methods. In this paper, we propose a method in which title words are used as indicators for the content of a research topic, and cited references are used as the context in which words get their meaning. Research topics are represented by sets of papers that are similar in terms of these word-reference combinations. In this way we use words without neglecting differences and changes in their meanings. The method has several advantages, such as high coverage of publications. As an illustration we apply the method to produce knowledge maps of information science.

Keywords: Aggregation, Combined Cocitation, Context, Indicators, Knowledge, Method, Research, Science

? Bjorneborn, L. (2006), ‘Mini small worlds’ of shortest link paths crossing domain boundaries in an academic Web space. *Scientometrics*, **68** (3), 395-414.

Full Text: [2006\Scientometrics68, 395.pdf](2006/Scientometrics68,%20395.pdf)

Abstract: Combining webometric and social network analytic approaches, this study developed a methodology to sample and identify Web links, pages, and sites that function as small-world connectors affecting short link distances along link paths between different topical domains in an academic Web space. The data set comprised 7669 subsites harvested from 109 UK universities. A novel corona-shaped Web graph model revealed reachability structures among the investigated subsites. Shortest link path netsfunctioned as investigable small-world link structures-’mini small worlds’-generated by deliberate juxtaposition of topically dissimilar subsites. Indicative findings suggest that personal Web page authors and computer science subsites may be important small-world connectors across sites and topics in an academic Web space. Such connectors may counteract balkanization of the Web into insularities of disconnected and unreachable subpopulations.

Keywords: Citation Networks, Collaboration Networks, Complex Networks, Computer, Function, Graphs, Internet, Link, Methodology, Model, Network, Social Network, Space, UK

? Borner, K., Penumarthy, S., Meiss, M. and Ke, W.M. (2006), Mapping the diffusion of scholarly knowledge among major US research institutions. *Scientometrics*, **68** (3), 415-426.

Full Text: [2006\Scientometrics68, 415.pdf](2006/Scientometrics68,%20415.pdf)

Abstract: This paper reports the results of a large scale data analysis that aims to identify the production, diffusion, and consumption of scholarly knowledge among top research institutions in the United States. A 20-year publication data set was analyzed to identify the 500 most cited research institutions and spatio-temporal changes in their inter-citation patterns. A novel approach to analyzing the dual role of institutions as producers and consumers of scholarly knowledge and to study the diffusion of knowledge among them is introduced. A geographic visualization metaphor is used to visually depict the production and consumption of knowledge. The highest producers and their consumers as well as the highest consumers and their producers are identified and mapped. Surprisingly, the introduction of the Internet does not seem to affect the distance over which scholarly knowledge diffuses as manifested by citation links. The citation linkages between institutions fall off with the distance between them, and there is a strong linear relationship between the log of the citation counts and the log of the distance. The paper concludes with a discussion of these results and future work.

Keywords: Analysis, Citation, Consumers, Data Analysis, Diffusion, Internet, Knowledge, Migration, Production, Research, Scale, United States, US

? Bornmann, L. and Daniel, H.D. (2006), Selecting scientific excellence through committee peer review - A citation analysis of publications previously published to approval or rejection of post-doctoral research fellowship applicants. *Scientometrics*, **68** (3), 427-440.

Full Text: [2006\Scientometrics68, 427.pdf](2006/Scientometrics68,%20427.pdf)

Abstract: We investigated committee peer review for awarding long-term fellowships to post-doctoral researchers as practiced by the Boehringer Ingelheim Fonds (B.I.F.)-a foundation for the promotion of basic research in biomedicine. Assessing the validity of selection decisions requires a generally accepted criterion for research impact. A widely used approach is to use citation counts as a proxy for the impact of scientific research. Therefore, a citation analysis for articles published previous to the applicants’ approval or rejection for a B.I.F. fellowship was conducted. Based on our model estimation (negative binomial regression model), journal articles that had been published by applicants approved for a fellowship award (n = 64) prior to applying for the B.I.F. fellowship award can be expected to have 37% (straight counts of citations) and 49% (complete counts of citations) more citations than articles that had been published by rejected applicants (n = 333). Furthermore, comparison with international scientific reference values revealed (a) that articles published by successful and non-successful applicants are cited considerably more often than the ‘average’ publication and (b) that excellent research performance can be expected more of successful than non-successful applicants. The findings confirm that the foundation is not only achieving its goal of selecting the best junior scientists for fellowship awards, but also successfully attracting highly talented young scientists to apply for B.I.F. fellowships.

Keywords: Analysis, Foundation, Impact, International, Long Term, Model, Performance, Predictive-Validity, Productivity, Promotion, Proxy, Regression, Research, Review, Science, Validity, Values

? Burrell, Q.L. (2006), Measuring concentration within and co-concentration between informetric distributions: An empirical study. *Scientometrics*, **68** (3), 441-456.

Full Text: [2006\Scientometrics68, 441.pdf](2006/Scientometrics68,%20441.pdf)

Abstract: There is a well-established literature on the use of concentration measures in informetrics. However, these works have usually been devoted to measures of concentration within a productivity distribution. In a pair of recent papers the author introduced two new measures, both based on the Gini ratio, for measuring the similarity of concentration of productivity between two different informetric distributions. The first of these was derived from Dagum’s notion of relative economic affluence, the second-in some ways analogous to the correlation coefficient-is completely new. The purpose of this study is to develop a purely empirical approach to comparative studies of concentration between informetric data sets using both within and between measures thereby greatly extending the original study which considered just two data sets for purposes of illustration of the methods of calculation of the measures.

Keywords: Concentration, Correlation, Distribution, Distributions, Economic, Empirical, Gini Index, Law, Literature, Productivity, Ratio, Recent

? Glänzel, W., Schlemmer, B., Schubert, A. and Thijs, B. (2006), Proceedings literature as additional data source for bibliometric analysis. *Scientometrics*, **68** (3), 457-473.

Full Text: [2006\Scientometrics68, 457.pdf](2006/Scientometrics68,%20457.pdf)

Abstract: Scientific meetings have become increasingly important channels for scholarly communi-cation. In several fields of applied and engineering sciences they are-according to the statements of scientists active in those fields-even more important than publishing in periodicals. One objective of this study is to analyse the weight of proceedings literature in all fields of the sciences, social sciences and humanities as well as the use of the ISI Proceedings database as additional data source for bibliometric studies. The second objective is exploring the use of a further important feature of this database, namely, of information about conference location for the analysis of bibliometrically relevant aspects of information flow such as the relative attractivity, the extent of mobility and unidirectional or mutual affinity of countries.

Keywords: Analysis, Communication, Flow, Literature, Mobility, Participation, Science, Scientific Meetings

? Klavans, R. and Boyack, K.W. (2006), Quantitative evaluation of large maps of science. *Scientometrics*, **68** (3), 475-499.

Full Text: [2006\Scientometrics68, 475.pdf](2006/Scientometrics68,%20475.pdf)

Abstract: This article describes recent improvements in mapping the world-wide scientific literature. Existing research is extended in three ways. First, a method for generating maps directly from the data on the relationships between hundreds of thousands of documents is presented. Second, quantitative techniques for evaluating these large maps of science are introduced. Third, these techniques are applied to data in order to evaluate eight different maps. The analyses suggest that accuracy can be increased by using a modified cosine measure of relatedness. Disciplinary bias can be significantly reduced and accuracy can be further increased by using much lower threshold levels. In short, much larger samples of papers can and should be used to generate more accurate maps of science.

Keywords: Evaluation, Knowledge Domains, Literature, Mapping, Method, Recent, Research

? Kousha, K. and Thelwall, M. (2006), Motivations for URL citations to open access library and information science articles. *Scientometrics*, **68** (3), 501-517.

Full Text: [2006\Scientometrics68, 501.pdf](2006/Scientometrics68,%20501.pdf)

Abstract: We define the URL citations of a Web page to be the mentions of its URL in the text of other Web pages, whether hyperlinked or not. The proportions of formal and informal scholarly motivations for creating URL citations to Library and Information Science open access journal articles were identified. Five characteristics for each source of URL citations equivalent to formal citations were manually extracted and the relationship between Web and conventional citation counts at the e-journal level was examined. Results of Google searches showed that 282 research articles published in the year 2000 in 15 peer-reviewed LIS open access journals were invoked by 3,045 URL citations. Of these URL citations, 43% were created for formal scholarly reasons equivalent to traditional citations and 18% for informal scholarly reasons. Of the sources of URL citations, 82% were in English, 88% were full text papers and 58% were non-HTML documents. Of the URL citations, 60% were text URLs only and 40% were hyperlinked. About 50% of URL citations were created within one year after the publication of the cited e-article. A slight correlation was found between average numbers of URL citations and average numbers of ISI citations for the journals in 2000. Separating out the citing HTML and non-HTML documents showed that formal scholarly communication trends on the Web were mainly influenced by text URL citations from non-HTML documents.

Keywords: Communication, Correlation, Links, Research, Sites, Trends, Web Impact Factors

? Lariviere, V., Gingras, Y. and Archambault, E. (2006), Canadian collaboration networks: A comparative analysis of the natural sciences, social sciences and the humanities. *Scientometrics*, **68** (3), 519-533.

Full Text: [2006\Scientometrics68, 519.pdf](2006/Scientometrics68,%20519.pdf)

Abstract: A basic dichotomy is generally made between publication practices in the natural sciences and engineering (NSE) on the one hand and social sciences and humanities (SSH) on the other. However, while researchers in the NSE share some common practices with researchers in SSH, the spectrum of practices is broader in the latter. Drawing on data from the CD-ROM versions of the Science Citation Index, Social Sciences Citation Index and the Arts & Humanities Citation Index from 1980 to 2002, this paper compares collaboration patterns in the SSH to those in the NSE. We show that, contrary to a widely held belief, researchers in the social sciences and the humanities do not form a homogeneous category. In fact, collaborative activities of researchers in the social sciences are more comparable to those of researchers in the NSE than in the humanities. Also, we see that language and geographical proximity influences the choice of collaborators in the SSH, but also in the NSE. This empirical analysis, which sheds a new light on the collaborative activities of researchers in the NSE compared to those in the SSH, may have policy implications as granting councils in these fields have a tendency to imitate programs developed for the NSE, without always taking into account the specificity of the humanities.

Keywords: Analysis, CD-ROM, Choice, Collaboration, Collaboration Networks, Data, Engineering, Humanities, Networks, Policy, Practices, Publication, Science Citation Index, Sciences, Social, Social Sciences, Specificity

? Liang, L.M., Rousseau, R. and Shi, F. (2006), A rhythm indicator for science and the rhythm of Science. *Scientometrics*, **68** (3), 535-544.

Full Text: [2006\Scientometrics68, 535.pdf](2006/Scientometrics68,%20535.pdf)

Abstract: The rhythm of science may be compared to the rhythm of music. The R-indicator studied in this article is a complex indicator, trying to reflect part of this rhythm. The R-indicator interweaves publication and citation data over a long period. In this way R-sequences can be used to describe the evolutionary rhythm of science considered in a novel way. As an example the R-sequence of the journal Science from 1945 on is calculated.

Keywords: Indicator

? Meyer, M. (2006), Knowledge integrators or weak links? An exploratory comparison of patenting researchers with their non-inventing peers in nano-science and technology. *Scientometrics*, **68** (3), 545-560.

Full Text: [2006\Scientometrics68, 545.pdf](2006/Scientometrics68,%20545.pdf)

Abstract: Policy-makers in many countries emphasize the importance of non-publication output of university research. Increasingly, policies are pursued that attempt to encourage entrepreneurial activity in universities and public research institutes. Apart from generating spin-out companies, technology licensing, and collaborative research, attention is focused on patenting activities of researchers. Some analysts suggest that there is a trade-off between scholarly publication and patenting activity. This paper explores this relationship drawing on a data set of nanoscience publications and nanotechnology patents in three European countries. In particular, this study examines whether researchers who both publish and patent are more productive and more highly cited than their peers who concentrate on scholarly publication in communicating their research results. Furthermore, this study investigates the collaborative activity of inventor-authors and their position in their respective networks of scientific communication. The findings suggest that overall there seems to be no adverse relationship between publication and patenting activity, at least not in this area of science and technology. Patenting scientists appear to outperform their solely publishing, non-inventing peers in terms of publication counts and citation frequency. However, while they are considerably over-represented in the top performance class, the data indicates that inventor-authors may not occupy top positions within that group. An analysis of co-authorship links indicates that patenting authors can also play a prominent role within networks of scientific communication. The network maps also point to groups where inventor-authors occur frequently and others where this is not the case, which possibly reflects cognitive differences between sub-fields. Finally, the data indicates that inventor-authors account only for a marginal share of publishing scholars while they play a substantial role amongst inventors.

Keywords: Activity, Analysis, Class, Collaborative Research, Communication, Dynamics, Entrepreneurial Universities, Industry, Innovation, Marginal, Nanotechnology, Network, Patterns, Peers, Performance, Point, Research, Scientists, University

? Persson, O. (2006), Exploring the analytical potential of comparing citing and cited source items. *Scientometrics*, **68** (3), 561-572.

Full Text: [2006\Scientometrics68, 561.pdf](2006/Scientometrics68,%20561.pdf)

Abstract: Comparing properties of citing and cited source items opens a wide variety of analytical possibilities. In a study of citations among papers in the journal Scientometrics a number of analytical themes are identified. The analysis shows: the way in which a citation graph can be decomposed into different subparts, country specific citation patterns, the effects of self-citations and domestic citations, the mapping of cited author relationships using direct citation and co-citation links, and time slicing effects on impact ranking of countries and papers.

Keywords: Analysis, Citations, Collaboration, Effects, Impact, Indicators, Mapping, Networks, Properties, Ranking, Time

? Schneider, J.W. (2006), Concept symbols revisited: Naming clusters by parsing and filtering of noun phrases from citation contexts of concept symbols. *Scientometrics*, **68** (3), 573-593.

Full Text: [2006\Scientometrics68, 573.pdf](2006/Scientometrics68,%20573.pdf)

Abstract: The present study presents a semi-automatic method for parsing and filtering of noun phrases from citation contexts of concept symbols. The purpose of the method is to extract contextual, agreed upon, and pertinent noun phrases, to be used in visualization studies for naming clusters (concept groups) or concept symbols. The method is applied in a case study, which forms part of a larger dissertation work concerning the applicability of bibliometric methods for thesaurus construction. The case study is carried out within periodontology, a specialty area of dentistry. The result of the case study indicates that the method is able to identify highly important noun phrases, and that these phrases accurately describe their parent clusters. Hence, the method is able to reduce the labour intensive work of manual citation context analysis, though further refinements are still needed.

Keywords: Analysis, Bibliometrics, Citing Statements, Cocitation, Computer Recognition, Context, Knowledge, Method, Parent, Retrieval, Word Analysis

? Small, H. (2006), Tracking and predicting growth areas in science. *Scientometrics*, **68** (3), 595-610.

Full Text: [2006\Scientometrics68, 595.pdf](2006/Scientometrics68,%20595.pdf)

Abstract: We explore the possibility of using co-citation clusters over three time periods to track the emergence and growth of research areas, and predict their near term change. Data sets are from three overlapping six-year periods: 1996-2001, 1997-2002 and 1998-2003. The methodologies of co-citation clustering, mapping, and string formation are reviewed, and a measure of cluster currency is defined as the average age of highly cited papers relative to the year span of the data set. An association is found between the currency variable in a prior period and the percentage change in cluster size and citation frequency in the following period. The conflating factor of ‘single-issue clusters’ is discussed and dealt with using a new metric called in-group citation.

Keywords: Age, Association, Citation-Index, Clustering, Cocitation, Growth, Literatures, Mapping, Mathematical Approach, Research, Scientific Discovery, Time

? Vaughan, L. and You, J. (2006), Comparing business competition positions based on Web co-link data: The global market vs. the Chinese market. *Scientometrics*, **68** (3), 611-628.

Full Text: [2006\Scientometrics68, 611.pdf](2006/Scientometrics68,%20611.pdf)

Abstract: Based on the findings from earlier studies which showed that links to business Websites contain useful business information, we examined the feasibility of using Web co-link data to compare business competitive positions. We hypothesized that the number of co-links to a pair of business Websites is a measure of the similarity between the two companies. Since similar or related businesses are competing businesses, the co-link data can be used to map business competitive positions. We selected 32 telecommunications companies for the study and collected co-link data to these companies from Yahoo!. Multidimensional scaling (MDS) analysis on the co-link data correctly mapped these companies into telecommunications industry sectors. This proved our hypothesis and further confirmed the theory that links to business Websites can be objects for Web data mining. We collected data in a way that would reflect two markets, the global market and the Chinese market. Results from the two data sets revealed the competitive positions of the companies in the two markets. We propose that regular data collection and analysis based on this method can be used to monitor the business competitive environment and trigger early warnings on the change of the competitive landscape.

Keywords: Analysis, Chinese, Citation, Competition, Data Collection, Environment, Global, Impact Factors, Information, Landscape, Method, Mining, Scaling, Sites, Theory

? Vinkler, P. (2006), Composite scientometric indicators for evaluating publications of research institutes. *Scientometrics*, **68** (3), 629-642.

Full Text: [2006\Scientometrics68, 629.pdf](2006/Scientometrics68,%20629.pdf)

Abstract: Both quantitative and qualitative evaluation of publications of research teams or institutes requires several scientometric indicators. In this paper a new composite indicator is introduced for the assessment of publications of research institutes working in different fields of science. The composite indicator consists of three part-indicators (Journal Paper Productivity, Relative Publication Strategy and Relative Paper Citedness). The different methods of calculating the composite index have only a slight effect on the value, whereas application of diverse weights for the individual part-indicators results in significant changes.

Keywords: Assessment, Chemistry, Evaluation, Impact, Indicator, Indicators, Performance, Physics, Qualitative, Research

? Yoshikane, F., Nozawa, T. and Tsuji, K. (2006), Comparative analysis of co-authorship networks considering authors’ roles in collaboration: Differences between the theoretical and application areas. *Scientometrics*, **68** (3), 643-655.

Full Text: [2006\Scientometrics68, 643.pdf](2006/Scientometrics68,%20643.pdf)

Abstract: Many studies have analyzed ‘direct’ partnerships in co-authorship networks. On the other hand, the global network structure, including ‘indirect’ links between researchers, has not yet been sufficiently studied. This study analyzes researchers’ activities from the viewpoints considering their roles in the global structures of co-authorship networks, and compares the co-authorship networks between the theoretical and application areas in computer science. The modified HITS algorithm is used to calculate the two types of importance of researchers in co-authorship networks, i.e., the importance as the leader and that as the follower.

Keywords: Algorithm, Analysis, Coauthorship Networks, Collaboration, Computer, Global, Invisible-Colleges, Issues, Journal Literature, Network, Patterns, Psychology, Science

? Callaert, J., Van Looy, B., Verbeek, A., Debackere, K. and Thijs, B. (2006), Traces of Prior Art: An analysis of non-patent references found in patent documents. *Scientometrics*, **69** (1), 3-20.

Full Text: [2006\Scientometrics69, 3.pdf](2006/Scientometrics69,%203.pdf)

Abstract: The recent developments towards more systemic conceptualizations of innovation dynamics and related policies highlight the need for indicators that mirror the dynamics involved. In this contribution, we assess the role that ‘non-patent references’, found in patent documents, can play in this respect. After examining the occurrence of these references in the USPTO and EPO patent systems, their precise nature is delineated by means of a content analysis of two samples of nonpatent references (n=10,000). Our findings reveal that citations in patents allow developing nontrivial and robust indicators. The majority of all non-patent references are journal references, which provide ample possibilities for large-scale analyses focusing on the extent to which technological developments are situated within the vicinity of scientific knowledge. Application areas, limitations and directions for future research are discussed.

Keywords: Academic Inventors, Analysis, Citation Analysis, Dynamics, Exploration, Indicators, Innovation, Knowledge, Limitations, Public Science, Recent, Research, Science-Technology Interactions, Statistics, Systems, Triple-Helix

? Lukenda, J. (2006), Influence of the 1991-1995 war on Croatian publications in the MEDLINE database. *Scientometrics*, **69** (1), 21-36.

Full Text: [2006\Scientometrics69, 21.pdf](2006/Scientometrics69,%2021.pdf)

Abstract: Aim: to identify the influence of the 1991-1995 war on Croatian biomedical publications with reference to the Croatian universities and medical centers in Zagreb, Split, Rijeka and Osijek and their regions. Methods: Internet provider PubMed was used to search MEDLINE database in the pre-war (1988-1990), war (1991-1995) and post-war (1996-2000) periods. Annual numbers of publications in the MEDLINE and Core Clinical Journals (Abridged Index Medicus, AIM-journals) were calculated for each center in the above mentioned periods. Our analysis included socio-economic indicators such as gross domestic product (GDP) and total employment, human resources such as the number of full-time researchers, teachers and researchers in biomedical sciences, university graduates, master and doctoral thesis. Descriptive statistics and t-test were used. Results: In the 1988-2000 period the proportion of Croatian publications in the MEDLINE database was 0.076%. The proportion of AIM-publication in the MEDLINE was 11.5%, while the proportion of Croatian AIM-publications in Croatian publications in the MEDLINE was only 0.02%. Compared to the pre-war period, Croatia increased the number of publications in the MEDLINE in the war period (p < 0.05) and post-war period (p < 0.01). In the war period GDP and other socio-economic indicators decreased in contrast to an increase in biomedical publications. All centers increased the number of MEDLINE publications significantly in the war and post-war periods (p < 0.01), while the growth of AIM-publications in Zagreb and Split was not significant. The proportion of biomedical publications in Zagreb decreased in the war and post-war periods while it was almost doubled in the other centers. Croatia increased its biomedical publication rates (per 100,000 inhabitants per year) from 3.8 (the pre-war period) to 6.6 (the war period) and 9.0 (the post-war period). In those periods biomedical publication rates were also increased in all centers with belonging regions, in spite of the war. A small number of teachers and researchers in biomedical sciences in Split and Osijek produced more publications per person in the war period than a larger number of their colleagues in other two centers. Conclusion: Croatia and its centers, Zagreb, Split, Rijeka and Osijek increased biomedical publication rates despite enormous destruction and human losses caused by the war. Despite a significant increase in the quantity of Croatian publications in the MEDLINE database, the number of AIM-publications increased only slightly.

Keywords: Analysis, Biomedical Publications, Countries, Employment, European-Union, Geography, Growth, Human, Indicators, Internet, Journals, Medical, Output, Science, Socio-Economic Indicators, Socioeconomic, Statistics, University, War

? Campanario, J.M., González, L. and Rodríguez, C. (2006), Structure of the impact factor of academic journals in the field of Education and Educational Psychology: Citations from editorial board members. *Scientometrics*, **69** (1), 37-56.

Full Text: [2006\Scientometrics69, 37.pdf](2006/Scientometrics69,%2037.pdf)

Abstract: We present a new approach to study the structure of the impact factor of academic journals. This new method is based on calculation of the fraction of citations that contribute to the impact factor of a given journal that come from citing documents in which at least one of the authors is a member of the cited journal’s editorial board. We studied the structure of three annual impact factors of 54 journals included in the groups ‘Education and Educational Research’ and ‘Psychology, Educational’ of the Social Sciences Citation Index. The percentage of citations from papers authored by editorial board members ranged from 0% to 61%. In 12 journals, for at least one of the years analysed, 50% or more of the citations that contributed to the impact factor were from documents published in the journal itself.

Given that editorial board members are considered to be among the most prestigious scientists, we suggest that citations from papers authored by editorial board members should be given particular consideration.

Keywords: Self-Citations, Bibliometric Analysis, Information-Science, Stands Today, Quality, Index, Proposal, Performance, Indicators, Institute

? Yoo, S.H. and Moon, H.S. (2006), A semi-parametric modeling of firms’ R&D expenditures with zero values. *Scientometrics*, **69** (1), 57-67.

Full Text: [2006\Scientometrics69, 57.pdf](2006/Scientometrics69,%2057.pdf)

Abstract: Modeling firms’ R&D expenditures often become complicated due to the zero values reported by a significant number of firms. The maximum likelihood (ML) estimation of the Tobit model, which is usually adopted in this case, however, is not robust to heteroscedastic and/or non-normal error structure. Thus, this paper attempts to apply symmetrically trimmed least squares estimation as a semi-parametric estimation of the Tobit model in order to model firms’ R&D expenditures with zero values. The result of specification test indicates the semi-parametric estimation outperforms the parametric ML estimation significantly.

Keywords: Econometrics, Limited Dependent-Variables, Maximum Likelihood, Misspecification, Model, Modeling, Specification, Values

? Medoff, M.H. (2006), The efficiency of self-citations in economics. *Scientometrics*, **69** (1), 69-84.

Full Text: [2006\Scientometrics69, 69.pdf](2006/Scientometrics69,%2069.pdf)

Abstract: Are prior self-citations an effective input in increasing a subsequent article’s citation count? Examination of 418 articles in eight economics journals found that, after controlling for article length, journal and author quality, lead article position, and coauthorship, an author’s prior stock of self-citations is not statistically related to a subsequent article’s total citation count or the quality of the journals in which those citations appear. Self-citations that appear in prestigious high-impact economics journals have a statistically positive, but numerically small, effect on a subsequent article’s total citation count and on the quality of the citing journal. The productive effect of a prior self-citation is inversely related to its age. Prior self-citations of the second author listed in a collaborative article have no significant effect on a subsequent article’s total citation count or the quality of the economics journals in which those citations appear.

Keywords: Age, Collaboration, Departments, Economics, Lead, Quality, Rankings, Trends

? Meng, W., Hu, Z.H. and Liu, W.B. (2006), Efficiency evaluation of basic research in China. *Scientometrics*, **69** (1), 85-101.

Full Text: [2006\Scientometrics69, 85.pdf](2006/Scientometrics69,%2085.pdf)

Abstract: Following the increasing investment on basic research in China, the outputs of basic research have been greatly enhanced. In this paper, the relative efficiency of investments in basic research is analyzed by adopting statistical regressions and Data Envelopment Analysis (DEA) method. Preliminary results show that injected investment seems to be the main driving force for the increased basic research outputs in China. It is found that there were significant improvements on overall efficiency from 1991 to 1996, although this trend has noticeably slowed down since 1996. Possible causes of this slow-down are discussed.

Keywords: China, Data Envelopment Analysis, DEA, Evaluation, Impact, Management, Method, Performance, Relative Efficiency, Research, Science, Trend, Universities

? Calvino, A.M. (2006), Assessment of research performance in food science and technology: Publication behavior of five Iberian-American countries (1992-2003). *Scientometrics*, **69** (1), 103-116.

Full Text: [2006\Scientometrics69, 103.pdf](2006/Scientometrics69,%20103.pdf)

Abstract: This study is a follow-up to a published descriptive outline on the publications of Iberian-American (IA) countries in food science and technology field. The number of articles and citations attained by IA producers (Argentina, Brazil, Mexico, Portugal and Spain) were examined on 48 journals indexed in Science Citation Index (SCI) database. The growth rate in publication between 1992 and 2003 depicted differences across journals, those with high impact factor were most preferred by IA authors. Different patterns of collaboration and frequency of citations were obtained. Spain and Argentina show the greatest counts of publications and citations but present the lowest percentages of collaboration with outside authors. Instead, three out of ten papers from Portugal, Mexico and Brazil are signed by at least one foreign author. The association of publication productivity to demographic and socio-economic indicators revealed that Spain and Portugal have the highest ratios of publications or citations by human resources followed by Argentina. Argentina showed the highest ratios of publications or citations by expenditure on science and technology activities.

Keywords: Argentina, Association, Behavior, Bibliometric Indicators, Brazil, Citation-Index, Collaboration, Descriptive, Expenditure, Follow-Up, Food, Growth, Growth Rate, Human, Impact, Impact Factors, Indicators, Journals, Mexico, Output, Performance, Portugal, Productivity, Ratios, Research, SCI, Scientific Production, Socio-Economic Indicators, Socioeconomic, Spain

? Saad, G. (2006), Exploring the h-index at the author and journal levels using bibliometric data of productive consumer scholars and business-related journals respectively. *Scientometrics*, **69** (1), 117-120.

Full Text: [2006\Scientometrics69, 117.pdf](2006/Scientometrics69,%20117.pdf)

Abstract: Using both author-level and journal-level data, Hirsch’s h-index is shown to possess substantial heuristic value in that it yields accurate results whilst requiring minimal informational acquisition effort. As expected, the h-index of productive consumer scholars correlated strongly with their total citation counts. Furthermore, the h-indices as obtained via ISI/Thompson and GoogleScholar were highly correlated albeit the latter yielded higher values. Finally, using a database of business-relevant journals, a significant correlation was found between the journals’ h-indices and their citation impact scores.

Keywords: Bibliometric, Citation, Citation Counts, Database, h Index, h-Index, Impact, Journal, Journals, Scientists, Value

? Egghe, L. and Rousseau, R. (2006), An informetric model for the Hirsch-index. *Scientometrics*, **69** (1), 121-129.

Full Text: [2006\Scientometrics69, 121.pdf](2006/Scientometrics69,%20121.pdf)

Abstract: The h-index (or Hirsch-index) was defined by Hirsch in 2005 as the number h such that, for a general group of papers, h papers received at least h citations while the other papers received no more than h citations. This definition is extended here to the general framework of Information Production Processes (IPPs), using a source-item terminology. It is further shown that in each practical situation an IPP always has a unique h-index. In Lotkaian systems h = T-1/alpha, where T is the total number of sources and alpha is the Lotka exponent. The relation between h and the total number of items is highlighted.

Keywords: Citations, Framework, General, h Index, h-Index, Hirsch, Hirsch Index, IPP, Lotka, Model, Papers, Ranking, Scientists, Terminology

? Egghe, L. (2006), Theory and practise of the g-index. *Scientometrics*, **69** (1), 131-152.

Full Text: [2006\Scientometrics69, 131.pdf](2006/Scientometrics69,%20131.pdf)

Abstract: The g-index is introduced as an improvement of the h-index of Hirsch to measure the global citation performance of a set of articles. If this set is ranked in decreasing order of the number of citations that they received, the g-index is the (unique) largest number such that the top g articles received (together) at least g(2) citations. We prove the unique existence of g for any set of articles and we have that g 3 h. The general Lotkaian theory of the g-index is presented and we show that g = (alpha-1/alpha-2)T-alpha-1/alpha(1/alpha) where alpha > 2 is the Lotkaian exponent and where T denotes the total number of sources. We then present the g-index of the (still active) Price medallists for their complete careers up to 1972 and compare it with the h-index. It is shown that the g-index inherits all the good properties of the h-index and, in addition, better takes into account the citation scores of the top articles. This yields a better distinction between and order of the scientists from the point of view of visibility.

Keywords: Careers, Citation, Citations, g Index, g-Index, General, h Index, h-Index, Hirsch, The Good, Theory, Visibility

? Liang, L.M. (2006), h-index sequence and h-index matrix: Constructions and applications. *Scientometrics*, **69** (1), 153-159.

Full Text: [2006\Scientometrics69, 153.pdf](2006/Scientometrics69,%20153.pdf)

Abstract: The calculation of Hirsch’s h-index is a detail-ignoring way, therefore, single h-index could not reflect the difference of time spans for scientists to accumulate their papers and citations. In this study the h-index sequence and the h-index matrix are constructed, which complement the absent details of single h-index, reveal different increasing manner and the increasing mechanism of the h-index, and make the scientists at different scientific age comparable.

Keywords: Age, Citations, h Index, h-Index, Mechanism, Papers, Ranking, Scientists

? Banks, M.G. (2006), An extension of the Hirsch index: Indexing scientific topics and compounds. *Scientometrics*, **69** (1), 161-168.

Full Text: [2006\Scientometrics69, 161.pdf](2006/Scientometrics69,%20161.pdf)

Abstract: An interesting twist of the Hirsch index is given, in terms of an index for topics and compounds. By comparing both the hb index and m for a number of compounds and topics, it can be used to differentiate between a new so-called hot topic with older topics. This quick method is shown to help new comers to identify how much interest and work has already been achieved in their chosen area of research.

Keywords: Method, Research

? Braun, T., Glänzel, W. and Schubert, A. (2006), A Hirsch-type index for journals. *Scientometrics*, **69** (1), 169-173.

Full Text: [2006\Scientometrics69, 169.pdf](2006/Scientometrics69,%20169.pdf)

Abstract: We suggest that a h-type index - equal to h if you have published h papers, each of which has at least h citations - would be a useful supplement to journal impact factors.

Keywords: Impact, Ranking, Scientists

? Zanotto, E.D. (2006), The scientists pyramid. *Scientometrics*, **69** (1), 175-181.

Full Text: [2006\Scientometrics69, 175.pdf](2006/Scientometrics69,%20175.pdf)

Abstract: In this short paper I propose a combination of qualitative and quantitative criteria to classify the quality, talent and creative thinking of the scientists of the ‘hard’, medical and biological sciences. The rationale for the proposed classification is to focus on the impact and overall achievements of each individual scientist and on how he is perceived by his own community. This new method is probably more complete than any other form of traditional judgment of a scientist’s achievements and reputation, and may be useful for funding agencies, editors of scientific journals, science academies, universities, and research laboratories.

Keywords: Classification, Community, Funding, Impact, Medical, Method, Qualitative, Quality, Research

? Rey-Rocha, J., Garzon-Garcia, B. and Martin-Sempere, J. (2006), Scientists’ performance and consolidation of research teams in Biology and Biomedicine at the Spanish Council for Scientific Research. *Scientometrics*, **69** (2), 183-212.

Full Text: [2006\Scientometrics69, 183.pdf](2006/Scientometrics69,%20183.pdf)

Abstract: Empirical evidence is given on how membership in a consolidated, well-established research team provides researchers with some competitive advantage as compared to their colleagues in non-consolidated teams. Data were obtained from a survey of researchers ascribed to the ‘Biology and Biomedicine’ area of the Spanish Council for Scientific Research, as well as from their curricula vitae. One quarter of the scientists work as members of teams in the process of consolidation. Our findings illustrate the importance, for the development and consolidation of research teams, of the availability of a minimum number of researchers with a permanent position and of a minimum number of support staff and non-staff personnel (mainly post-doctoral fellows). Consolidation of research teams has a clear influence on the more academic-oriented quantitative indicators of the scientific activity of individuals. Researchers belonging to consolidated teams perform quantitatively better than their colleagues in terms of the number of articles published in journals covered in the Journal Citation Reports, but not in terms of the impact of these publications. Consolidation favours publication, but not patenting, and it also has a positive effect on the academic prestige of scientists and on their capacity to train new researchers. It does not significantly foster participation in funded R&D projects, nor does it influence the establishment of international collaborations. Impact is influenced to a remarkable degree by seniority and professional background, and is significantly greater for young scientists who have spent time abroad at prestigious research laboratories.

Keywords: Activity, Age, Background, Bibliometric Analysis, Capacity, Career, Curricula, Determinants, Development, Evidence, Impact, Indicators, International, Laboratory Size, Nov, Participation, Performance, Process, Projects, Publication Productivity, Research, Research Collaboration, Research Productivity, Staff, Survey, Time, University

? Pinto, M. (2006), A grounded theory on abstracts quality: Weighting variables and attributes. *Scientometrics*, **69** (2), 213-226.

Full Text: [2006\Scientometrics69, 213.pdf](2006/Scientometrics69,%20213.pdf)

Abstract: The goal is to deepen the knowledge of both sides of the abstract/ing topic: abstracting variables and abstract attributes. Six abstracting variables (representing abstract, represented source, abstracting means, documentary goal, cognitive domain and user needs) and eight abstract attributes (representativeness, comprehensiveness, usefulness, accuracy, consistency, coherence, density and perceived quality) are proposed and weighted. While abstracting means is uncovered as the main abstracting variable, the representativeness and accuracy attributes stand out, and usefulness, comprehensiveness, consistency, coherence and density are regarded as the basic ones. The feedback of this quality model is performed by the perceived quality attribute, which depends exclusively on users.

Keywords: Abstract, Consistency, Density, Feedback, Information, Knowledge, Model, Needs, Nov, Quality, Research Articles, Theory

? Bollen, J. and de Sompel, H.V. (2006), Mapping the structure of science through usage. *Scientometrics*, **69** (2), 227-258.

Full Text: [2006\Scientometrics69, 227.pdf](2006/Scientometrics69,%20227.pdf)

Abstract: Science has traditionally been mapped on the basis of authorship and citation data. Due to publication and citation delays such data represents the structure of science as it existed in the past. We propose to map science by proxy of journal relationships derived from usage data to determine research trends as they presently occur. This mapping is performed by applying a principal components analysis superimposed with a k-means cluster analysis on networks of journal relationships derived from a large set of article usage data collected for the Los Alamos National Laboratory research community. Results indicate that meaningful maps of the interests of a local scientific community can be derived from usage data. Subject groupings in the mappings corresponds to Thomson ISI subject categories. A comparison to maps resulting from the analysis of 2003 Thomson ISI Journal Citation Report data reveals interesting differences between the features of local usage and global citation data.

Keywords: Analysis, Citation, Cluster Analysis, Combined Cocitation, Community, Global, Impact, Journals, Mapping, Networks, Nov, Proxy, Publication Delays, Research, Scientific Literature, Social Desirability Bias, Trends, Word Analysis

? Nwagwu, W. (2006), A bibliometric analysis of productivity patterns of biomedical authors of Nigeria during 1967-2002. *Scientometrics*, **69** (2), 259-269.

Full Text: [2006\Scientometrics69, 259.pdf](2006/Scientometrics69,%20259.pdf)

Abstract: Bibliographic data on biomedical literature of Nigeria drawn from articles listed in Medline covering the period 1967-2002, and numbering 6820 were analysed to study the pattern of productivity of various author categories using Lotka’s law. The total of 2184 authors who wrote the papers was divided into four different files, namely all authors, first authors, non-collaborative authors and co-authors. We hypothesized that the productivity patterns of each of the categories of authors differed from Lotka’s inverse power law. The results showed that only the co-author category differed from the inverse power version of the law, while the other categories did not, although they yielded various exponents.

Keywords: Analysis, Distributions, Literature, Lotka Law, Nigeria, NOV, Pattern, Productivity, Scientific Productivity

? Peng, D., Loh, M. and Mondry, A. (2006), Publication lag in biomedical journals varies due to the periodical’s publishing model. *Scientometrics*, **69** (2), 271-286.

Full Text: [2006\Scientometrics69, 271.pdf](2006/Scientometrics69,%20271.pdf)

Abstract: Research manuscripts face various time lags from initial submission to final publication in a scientific periodical. Three publishing models compete for the market. Professional publishing houses publish in print and/or online in a ‘reader-pays’ model, or follow the open access model of ‘author-pays’, while a number of periodicals are bound to learned societies. The present study aims to compare the three business models of publishing, with regards to publication speed. 28 topically similar biomedical journals were compared. Open access journals have a publication lag comparable to journals published by traditional publishers. Manuscript submitted to and accepted in either of these two types of periodicals are available to the reader much faster than manuscripts published in journals with strong ties to specialized learned societies.

Keywords: Articles, Controlled-Trials, Impact, Model, Models, NOV, Time

? Ventura, O.N. and Mombru, A.W. (2006), Use of bibliometric information to assist research policy making. A comparison of publication and citation profiles of Full and Associate Professors at a School of Chemistry in Uruguay. *Scientometrics*, **69** (2), 287-313.

Full Text: [2006\Scientometrics69, 287.pdf](2006/Scientometrics69,%20287.pdf)

Abstract: Publication and citation profiles of Full and Associate Professors at the School of Chemistry of the Universidad de la Republica in Uruguay were investigated. The groups do not exhibit markedly different age averages. However, the average time since they started publishing, as well as other characteristics of their publication records, like productivity or citations, set them apart. From the point of view of both the number of papers per author and per year of activity, on one side, and of the number of citations per year of activity, on the other, the group of Full Professors has statistically significant larger averages than the Associate Professors. The impact of self-citations, multi-authorship and internationalization of the publications were analyzed within the two groups and shown to have no excessive or predictable influence on those parameters, except in the case of few (<= 2) or many (> 8) authors. It is suggested in this paper that these two indicators, number of papers per author per production year and number of citations per production year, combined in a plot allowing a bidimensional ranking of the individuals in the groups, may be used profitably as one of the components in the development of a policy toward promotion of Associate Professors. The analysis showed also that the quotient of citations received to number of papers published, even when derived from actual citation data of the scientists without involving the impact factors of the journals in which they publish, are not good parameters to use for that purpose, essentially because there is a reduction in the information content of the indicator with respect to those described before.

Keywords: Activity, Age, Analysis, Author Self-Citations, Collaboration, Development, Economics, Impact, Indicator, Indicators, Journal Impact, Macro, NOV, Output, Point, Policy, Policy Making, Production, Productivity, Promotion, Ranking, Research, Science, Time, Uruguay

? Siddiqi, A.F. (2006), Age likes some years - A case study for ages more prone to death. *Scientometrics*, **69** (2), 315-321.

Full Text: [2006\Scientometrics69, 315.pdf](2006/Scientometrics69,%20315.pdf)

Abstract: A person can die at any age. It is an omni-spoken common saying. Is it really true? Are all ages equally prone to die? Does there exist some predictable pattern that may conjecture the incidence of death? These are the questions that are attempted here in this article. Literature is replete with cohort dependant age distributions and pyramids that focus, and are adjusted, primarily for the living persons. The current article is using a cohort free group of people and focuses exclusively on age at death to rummage for some pattern in these ages. A statistical investigation is made of the life span of human beings of previous two centuries. The life span, or age, distribution is revealed to be a quadric modal in nature, refuting the prevailed myth that all ages are equally susceptible to death.

Keywords: Age, Cohort, Distribution, Distributions, Human, Incidence, Life-Span, NOV, Pattern

? Galvez, C. and Moya-Anegon, F. (2006), The unification of institutional addresses applying parametrized finite-state graphs (P-FSG). *Scientometrics*, **69** (2), 323-345.

Full Text: [2006\Scientometrics69, 323.pdf](2006/Scientometrics69,%20323.pdf)

Abstract: We propose a semi-automatic method based on finite-state techniques for the unification of corporate source data, with potential applications for bibliometric purposes. Bibliographic and citation databases have a well-known problem of inconsistency in the data at micro-level and meso-level, affecting the quality of bibliometric searches and the evaluation of research performance. The unification method applies parametrized finite-state graphs (P-FSG) and involves three stages: (1) breaking of corporate source data in independent units of analysis, (2) creation of binary matrices, and (3) drawing finite-state graphs. This procedure was tested on university departmental addresses, downloaded from the ISI Web of Science. Evaluation was in terms of an adaptation of the measures of precision and recall. The results demonstrate the usefulness of this approach, though it requires some human processing.

Keywords: Adaptation, Analysis, Bibliometric Indicators, Citation Analysis, Creation, Databases, Delimitation, Evaluation, Human, Institutional, Issues, Method, NOV, Output, Performance, Physics, Quality, Research, Stages, Standardization, Strategies, Universities, University

? Kademani, B.S., Kumar, V., Sagar, A. and Kumar, A. (2006), World literature on thorium research: A scientometric study based on Science Citation Index. *Scientometrics*, **69** (2), 347-364.

Full Text: [2006\Scientometrics69, 347.pdf](2006/Scientometrics69,%20347.pdf)

Abstract: This paper attempts to highlight quantitatively the growth and development of world literature on thorium in terms of publication output as per Science Citation Index (1982-2004). During 1982-2004 a total of 3987 papers were published by the scientists in the field ‘thorium’. The average number of publications published per year were 173. The highest number of papers 249 were published in 2001. The spurt in the literature output was reported during 1991-2004.There were 94 countries involved in the research in this field. USA is the top producing country with 1000 authorships (21.11%) followed by India with 498 authorships (10.51%). Authorship and collaboration trend was towards multi-authored papers. Intensive collaboration was found during 1990-2004.One paper ‘Nuclear Instruments and Methods in Physics Research - A 406 (3) (1998) 411-426’ had 64 collaborators. There were 586 international collaborative papers. Bilateral collaboration accounted for 80.55 percent of total collaborative papers. Bhabha Atomic Research Centre (India) topped the list with 153 authorships followed by Los Alamos National Laboratory (USA) with 105 authorships.The most preferred journals by the scientists were: Journal of Radioanalytical Nuclear Chemistry with 181 papers, Radiochimica Acta with 139 papers, Journal of Radioanalytical Nuclear Chemistry -Articles with 127 papers, Geochimica Cosmochimica Acta with 96 papers, Health Physics with 91 papers, Applied Radiation and Isotopes with 88 papers, Journal of Alloys and Compounds with 65 papers, Earth and Planetary Science letters with 59 papers and Chemical Geology, Indian Journal of Chemistry -A, Radiation Protection Dosimetry with 55 papers each. English was the most predominant language used by the scientists for communication. The high frequency keywords were: Thorium (500), Uranium (284), Separation (94), Thorium Isotopes (90), Thorium(IV) (86), Seawater (73), Solvent Extraction (70), and Rare Earth Elements (68).

Keywords: Collaboration, Communication, Development, Field, Growth, India, Indicators, Industry, Interface, International, IV, Literature, NOV, Nuclear-Fuels, Research, Thorium, Trend, USA

? Campanario, J.M. and Gonzalez, L. (2006), Journal self-citations that contribute to the impact factor: Documents labeled ‘editorial material’ in journals covered by the Science Citation Index. *Scientometrics*, **69** (2), 365-386.

Full Text: [2006\Scientometrics69, 365.pdf](2006/Scientometrics69,%20365.pdf)

Abstract: We investigated the distribution of citations included in documents labeled by the ISI as ‘editorial material’ and how they contribute to the impact factor of journals in which the citing items were published. We studied all documents classified by the ISI as ‘editorial material’ in the Science Citation Index between 1999 and 2004 (277,231 records corresponding to editorial material published in 6141 journals). The results show that most journals published only a few documents that included 1 or 2 citations that contributed to the impact factor, although a few journals published many such documents. The data suggest that manipulation of the impact factor by publishing large amounts of editorial material with many citations to the journal itself is not a widely used strategy to increase the impact factor.

Keywords: Distribution, Impact, Manipulation, NOV

? Baldini, N. (2006), The Act on inventions at public research institutions: Danish universities’ patenting activity. *Scientometrics*, **69** (2), 387-407.

Full Text: [2006\Scientometrics69, 387.pdf](2006/Scientometrics69,%20387.pdf)

Abstract: This paper focuses on the Danish Act No. 347 of 1999, which granted IPRs on inventions at public research institutions to the institutions themselves. After summarizing the situation in Denmark prior to the new law, I describe the Act’s main features and then I turn my attention to the solutions adopted by Danish academia to face the opportunities and challenges posed by the new situation. Finally, using a unique dataset including all patents filed by Danish universities from 1982 to 2003, I describe university patenting activity.

Keywords: Academic Knowledge, Activity, Bayh-Dole Act, Denmark, Entrepreneurial, European University, Growth, Industry, Intellectual Property, Ivory Tower, NOV, of-Technology, Research, Technology-Transfer, University

? Schubert, A. and Glänzel, W. (2006), Cross-national preference in co-authorship, references and citations. *Scientometrics*, **69** (2), 409-428.

Full Text: [2006\Scientometrics69, 409.pdf](2006/Scientometrics69,%20409.pdf)

Abstract: The macro-level country-by-country co-authorship, cross-reference and cross-citation analysis started in our previous paper, 1 continues with revealing the cross-national preference stucture of the 36 selected countries. Preference indicators of co-authorship, cross-reference and cross-citation are defined, presented and discussed. The study revealed that geopolitical location, cultural relations and language are determining factors in shaping preferences whether in co-authorship, cross-reference or cross-citation. Areas like Central Europe, Scandinavia, Latin America (supplemented with Spain and Portugal), the Far East or the Australia-New Zealand-South Africa triad form typical ‘clusters’ with mutually strong preferences towards each other. The USA appears to have a distinguished role enjoying universal preference, which - in the cross-reference and cross-citation case - is asymmetric for the greater part of the countries under study.

Keywords: Africa, Analysis, Cooperation, Countries, Europe, Indicators, International Collaboration, Latin America, Link Indicator, Matrices, NOV, Portugal, Profiles, Science, Spain, Typology, USA

? Roth, C. and Bourgine, P. (2006), Lattice-based dynamic and overlapping taxonomies: The case of epistemic communities. *Scientometrics*, **69** (2), 429-447.

Full Text: [2006\Scientometrics69, 429.pdf](2006/Scientometrics69,%20429.pdf)

Abstract: We present a method for describing taxonomy evolution. We focus on the structure of epistemic communities (ECs), or groups of agents sharing common knowledge concerns. Introducing a formal framework based on Galois lattices, we categorize ECs in an automated and hierarchically structured way and propose criteria for selecting the most relevant epistemic communities - for instance, ECs gathering a certain proportion of agents and thus prototypical of major fields. This process produces a manageable, insightful taxonomy of the community. Then, the longitudinal study of these static pictures makes possible an historical description. In particular, we capture stylized facts such as field progress, decline, specialization, interaction (merging or splitting), and paradigm emergence. The detection of such patterns in epistemic networks could fruitfully be applied to other contexts.

Keywords: Authors, Communities, Community, Evolution, Galois Lattices, Knowledge, Longitudinal Study, Map, Method, Model, Networks, NOV, Process, Sciences, Taxonomy, Zebrafish

? Huang, C., Varum, C.A. and Gouveia, J.B. (2006), Scientific productivity paradox: The case of China’s S&T system. *Scientometrics*, **69** (2), 449-473.

Full Text: [2006\Scientometrics69, 449.pdf](2006/Scientometrics69,%20449.pdf)

Abstract: In 1985 China began the reform of its Science & Technology (S&T) sector inherited from the planned economy. To disclose the impact of the drawn-out reform on the efficiency of the whole sector, we measure the scientific productivity of China’s S&T institutes. The analysis is based on R&D input and output data at the country aggregate and provincial level. We utilize Polynomial Distributed Lag model to uncover the structure of the lag between R&D input and output. The findings reveal that the growth rate of scientific productivity of China’s S&T institutes has been negative since the 1990s.

Keywords: Analysis, China, Computer-Science, Exploration, Growth, Growth Rate, Impact, India, Innovation, Model, NOV, Policy, Productivity, Reform, Research Performance, Scientometrics, Time-Series, Unit-Root

? Mattes, E., Stacey, M.C. and Marinova, D. (2006), Surveying inventors listed on patents to investigate determinants of innovation. *Scientometrics*, **69** (3), 475-498.

Full Text: [2006\Scientometrics69, 475.pdf](2006/Scientometrics69,%20475.pdf)

Abstract: This paper reviews the methods and findings of studies surveying inventors on nationally representative sample of patents or patent applications. These studies show that the most common inventor is a middle-aged man with a postgraduate qualification, with women representing only 0.4% to 3.5% of inventors. They demonstrate that 43% to 68% of granted patents become innovations (52% on average). Despite Such findings this body of work has only been cited 61 times in scientific journals. Thus, Surveys of inventors provide good insights into the process of coin mercial ising patents and yet are an underutilised method especially within the literature on innovation.

Keywords: Applications, Individual Inventor, Industry, Methods, Paper, Reviews, Rights, United-States, Women

? Walters, G.D. (2006), Predicting subsequent citations to articles published in twelve crime-psychology journals: Author impact versus journal impact. *Scientometrics*, **69** (3), 499-510.

Full Text: [2006\Scientometrics69, 499.pdf](2006/Scientometrics69,%20499.pdf)

Abstract: Four hundred and twenty-eight articles published in 12 crime-psychology journals during the 2003 calendar year were reviewed for subsequent citations in the Social Science Citation Index (SSCI). Fifteen potential predictors were reduced to nine after subjecting the 15 variables to a principal components analysis with varimax rotation. The nine predictors included author characteristics - gender, occupational affiliation (acadeinic-nonacademic), national affiliation (U.S.-other), citations per 2001-2002 first author publications - article characteristics collaboration (single author-multiple author), article length, reviews, subject matter (coffectioiis/criminology-legal/foreiisic) - and journal characteristics - journal impact. Negative binomial regression of the citations earned by these 428 journal articles in a 23 to 34 month follow-up (M = 28 months) revealed significant effects for citations per 2001-2002 first author publications, national affiliation, and review articles. These results suggest that author impact may be a more powerful predictor of citations received by a journal article than the periodical in which the article appears.

Keywords: Analysis, Effects, Eminence, Evaluating Research, Follow Up, Follow-Up, Gender, Impact, Matter, Occupational, Predictors, Principal Components, Principal Components Analysis, Review, Reviews, Rotation, Science, Scientific Productivity

? Yu, G., Guo, R. and Li, Y.J. (2006), The influence of publication delays on three ISI indicators. *Scientometrics*, **69** (3), 511-527.

Full Text: [2006\Scientometrics69, 511.pdf](2006/Scientometrics69,%20511.pdf)

Abstract: Based on the transform function model of the observed citing process, the analytical expression of the age distribution of citations is deduced, and it is theoretically proved that the peak Value of the citation distribution curve Would fall and shift backward along with increasing the average publication delay and the peak age has a direct proportion relation with the pure delay and would be prolonged along with increasing the delay or decreasing the aging rate. The influence of the average publication delay on three ISI indicators impact factor, immediacy index and cited half-life are studied, in one subject discipline, the bigger the delay, the lower the three indicators of journals. Using the sensitivity theory, sensitivity formulae of the three indicators to publication delay parameters are deduced and it is found that responses of these indicators to changes of publication delays are different according to different time constant of the aging process: The faster the aging rate of a discipline literature is, the worse the influence of publication delays on the indicators of journals in the discipline.

Keywords: Age, Age Distribution, Aging, Citations, Cited Half-Life, DEC, Distribution, Fall, Function, Half-Life, Immediacy Index, Impact, Impact Factor, Index, Indicators, ISI, Model, Parameters, Process, Publication, Sensitivity, Theory

? Meneghini, R., Mugnaini, R. and Packer, A.L. (2006), International versus national oriented Brazilian scientific journals. A scientometric analysis based on SciELO and JCR-ISI databases. *Scientometrics*, **69** (3), 529-538.

Full Text: [2006\Scientometrics69, 529.pdf](2006/Scientometrics69,%20529.pdf)

Abstract: SciELO (Scientific Electronic Library on Line, www.scielo.bireme.br) is a program aimed at offering a core of Brazilian Scientific Journals in an open access mode at internet. This initiative has been followed by other Latin American, Caribbean and Iberian countries. Along with the development of the open accessed electronic library, a complementary scientometric/bibliometric database has been set up which permit to retrieve citation data of more than 40,000 articles. The robustness that this database has now achieved allows one to make important studies which were not possible before, using only the international Institute for Scientific Information (ISI) database.

Keywords: Access, Analysis, Caribbean, Citation, Core, Databases, Dec, Development, Institute for Scientific Information, Internet, ISI, Journals, Program, Robustness, Scientific Journals

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Full Text: [2006\Scientometrics69, 539.pdf](2006/Scientometrics69,%20539.pdf)

Abstract: China has made great progress in economy and science in the last two decades. Its scientific development in gastroenterology has been seldom reported. Using two authoritative bibliographic databases, Science Citation Index Expanded (SCI-E) and Medline, we analyze China’s research output in gastroenterology journals from 1990 to 2004. After detailed analysis, we found that China have greatly advanced in gastroenterology research, but the growth of Chinese articles in gastroenterology journals can largely be attributed to the selection of China-based journals into international bibliographic databases.

Keywords: Analysis, Bibliographic Databases, Bibliometric, Bibliometric Analysis, China, Chinese, Databases, DEC, Development, Economy, Growth, Hepatology, Impact, ISI, Japan, Journals, Made, Medline, Output, Research, Science, Science Citation Index, Scientific Publications, Selection, World

? Shin, J., Lee, W. and Park, Y. (2006), On the benchmarking method of patent-based knowledge flow structure: Comparison of Korea and Taiwan with USA. *Scientometrics*, **69** (3), 551-574.

Full Text: [2006\Scientometrics69, 551.pdf](2006/Scientometrics69,%20551.pdf)

Abstract: This paper suggests an international benchmarking method of disembodied knowledge flow structure. Using patent citation as a proxy measure of disembodied knowledge flow, national knowledge network is developed. Structural equivalence measure is applied to comparing the knowledge network of Korea and Taiwan with that of USA. Static and dynamic compafison make it possible to benchmark disembodied knowledge flow structure efficiently and identify convergent and divergent industries between developing countries and USA. It is also a mesostudy that could be conducive to building a comprehensive analytical framework of national innovation system.

Keywords: Building, China, Determinants, Developing Countries, Flow, Innovation Systems, Knowledge, Paper, Proxy, Structure, Taiwan, USA

? Lundberg, J., Tomson, G., Lundkvist, I., Skar, J. and Brommels, M. (2006), Collaboration uncovered: Exploring the adequacy of measuring university-industry collaboration through co-authorship and funding. *Scientometrics*, **69** (3), 575-589.

Full Text: [2006\Scientometrics69, 575.pdf](2006/Scientometrics69,%20575.pdf)

Abstract: Analysing co-authored publications has become the standard way to measure research collaborations. At the same time bibliometric researchers have advised that co-authorship based indicators should be handled with care as a source of evidence on actual scientific collaboration. The aim of this study is to assess how well university-industry collaborations can be identified and described rising co-authorship data. This is done through a comparison of co-authorship data with industrial funding to a medical university. In total 436 companies were identified through the two methods. Our results show that one third of the companies that have provided funding to the university had not co-authored any publications with the university. Further, the funding indicator identified only 16% of the companies that had co-authored publications. Thus, both co-authorship and funding indicators provide incomplete results. We also observe a case of conflicting trends between funding and co-authorship indicators. We conclude that uncritical use of the two indicators may lead to misinterpretation of the development of collaborations and thus provide incorrect data for decision-making.

Keywords: Adequacy, Bibliometric, Co-Authorship, Collaboration, Comparison, DEC, Decision Making, Decision-Making, Development, Funding, Indicator, Indicators, Industrial, Innovations, Lead, Medical, Methods, Partnerships, Publications, Reflections, Research, Scientific Collaboration, Source, Standard, Trends

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Full Text: [2006\Scientometrics69, 591.pdf](2006/Scientometrics69,%20591.pdf)

Abstract: Peer reviews are highly valued in academic life, but are notoriously unreliable. A major problem is the substantial measurement error due to the idiosyncratic responses when large numbers of different assessors each evaluate only a single or a few submissions (e.g., journal articles, grants, etc.). To address this problem. the main funding body of academic research in Australia conducted a trial ‘reader system’ in which each of a small number of senior academics read all proposals within their subdiscipline. The traditional peer review process for 1996 (2,989 proposals, 6,233 assessors) resulted in unacceptably low reliabilities comparable with those found in other research (0.475 for research project, 0.572 for researcher). For proposals from psychology and education in 1997, the new reader system resulted in substantially higher reliabilities: 0.643 and 0.881, respectively. In comparison to the traditional peer review approach, the new reader system is substantially more reliable, timely, and cost efficient - and applicable to many peer review situations.

Keywords: Australia, Context, Cost, Decisions, Education, Experiment, Interjudgmental Reliability, Journals, Life, Manuscript, Measurement, Peters, Proposals, Ratings, Research, Review, Reviews, Science, Validity

? Ceci, A., De Marchi, M. and Rocchi, M. (2006), A note on innovation in the chemical industry in Italy. *Scientometrics*, **69** (3), 607-614.

Full Text: [2006\Scientometrics69, 607.pdf](2006/Scientometrics69,%20607.pdf)

Abstract: In our analysis we have recalled the general results of recent studies on innovation according to which innovation within the manufacturing industry is a complex phenomenon which does not lend itself to description or explanation utilising simplistic analytical models. We have then taken into account clues garnered from various descriptions of the innovative behaviour of companies Utilising several indicators of how innovative they are. Our results confirm the belief that notable differences exist between the two sub-sectors into which the chemical industry is divided: pharmaceutical and basic chemicals. Regarding the policy implications of our research, the close correlation between patents and basic research expenditure suggests that the Italian Fund for Basic Research might play a useful role in promoting innovation in the chemical industry.

Keywords: Analysis, Basic Research, Chemical, Chemicals, Complex, Correlation, Indicators, Italy, Manufacturing, Models, Policy, Policy Implications, Recent, Research, Science

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Full Text: [2006\Scientometrics69, 615.pdf](2006/Scientometrics69,%20615.pdf)

Abstract: According to a widely used introductory chemistry text by T. E. Brown et al.,(1) chemistry is ‘The Central Science’. But scientometric co-citation analyses indicate that biochemistry seems presently to be more interconnected to other sciences. On the other hand, mathematics is considered by many to permeate all sciences and hence might compete as the choice for centrality. A critical commentary and argument leads to a proposal for an alternative partially ordered hierarchical ‘framework’ map of sciences. This argument is supplemented by a scientometric approach based on university Course requirements for different curricula, so as to support our partially ordered map. This alternative ‘framework’ mapping then is seen to indicate a special position for chemistry, as where significant branching begins.

Keywords: Biochemistry, Biology, Co-Citation, Cocitation, Curricula, dec, Emergence, Hand, Mapping, Position, Requirements, Sciences, Scientific Literatures, Support, Understanding Life

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Full Text: [2006\Scientometrics69, 639.pdf](2006/Scientometrics69,%20639.pdf)

Abstract: Tetrachloro-dibenzo-dioxins were declared as human carcinogenic substances in 1997. Objective: to analyse the scientific production about tetrachloro-dibenzo-dioxins between 1976 and 2005. Sella Price and Bradford models were applied. Different aspects of papers were analysed. Impact factor of journals was studied. 3484 articles were found. The number of articles published each year is fitted to Solla Price model. It has been shown the scientific literature dispersion. Specialisation of some journals of Nucleus and 1(st) Bradford Zone has been shown.

Keywords: Bibliometric, Bibliometric Study, Cancer, Carcinogenic, DEC, Dispersion, Human, Index, Journals, Law, Model, Models, Population, Production, Scientific Production

? Maier, G. (2006), Impact factors and peer judgment: The case of regional science journals. *Scientometrics*, **69** (3), 651-667.

Full Text: [2006\Scientometrics69, 651.pdf](2006/Scientometrics69,%20651.pdf)

Abstract: This paper discusses the relationship between Journal Impact Factors and the scientific community’s judgment of the quality of journals in regional science, a discipline closely related to economics and geography. The paper compares the results of a survey inquiring the quality of journals in the discipline with the impact factors of these journals for a total of five years. The comparison shows that no significant positive correlation between the impact factors and the peer judgments can be found. In many cases the correlation turns out to be negative - in some cases even significantly.

Keywords: Bibliometric Indicators, Citation, Comparison, Correlation, Criteria, DEC, Economics, Geography, Impact, Impact Factors, Journals, Market, Paper, Quality, Ranking, Ratings, Regional, Science, Survey, Universities

? Bollen, J., Rodriguez, M.A. and Van De Sompel, H. (2006), Journal status. *Scientometrics*, **69** (3), 669-687.

Full Text: [2006\Scientometrics69, 669.pdf](2006/Scientometrics69,%20669.pdf)

Abstract: The status of an actor in a social context is commonly defined in terms of two factors: the total number of endorsements the actor receives from other actors and the prestige of the endorsing actors. These two factors indicate the distinction between popularity and expert appreciation of the actor. respectively. We refer to the former as popularity and to the latter as prestige. These notions of popularity and prestige also apply to the domain of scholarly assessment. The ISI Impact Factor (ISI IF) is defined as the mean number of citations a journal receives over a 2 year period. By merely Counting the amount of citations and disregarding the prestige of the citing journals, the ISI IF is a metric of popularity, not of prestige. We demonstrate how a weighted version of the popular PageRank algorithm can be used to obtain a metric that reflects prestige. We contrast the rankings Of journals according to their ISI IF and their Weighted PageRank, and we provide an analysis that reveals both significant overlaps and differences. Furthermore, we introduce the Y-factor which is a simple combination of both the ISI IF and the weighted PageRank, and find that the resulting journal rankings correspond well to a general understanding of journal status.

Keywords: Algorithm, Analysis, Assessment, Impact Factor, Index, Quality, Research Output, Researchers, Social

? Contreras, C., Edwards, G. and Mizala, A. (2006), The Current Impact Factor and the long-term impact of scientific journals by discipline: A logistic diffusion model estimation. *Scientometrics*, **69** (3), 689-695.

Full Text: [2006\Scientometrics69, 689.pdf](2006/Scientometrics69,%20689.pdf)

Abstract: This paper estimates the long-term impact of journals aggregated in 24 different fields, using a simple logistic diffusion model, and relates the results to the current impact factor. Results show that while the current and the long-term impact factors have a high cot-relation coefficient, some fields are systematically slower-moving than others, as they often differ in the proportion of the overall impact through time that occurs in the short term.

Keywords: Diffusion, Estimation, Impact, Impact Factors, Model, Paper

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Full Text: [2007\Scientometrics70, 3.pdf](2007/Scientometrics70,%203.pdf)

Abstract: This paper describe an approach for improving the data quality of corporate sources when databases are used for bibliometric purposes. Research management relies on bibliographic databases and citation index systems as analytical tools, yet the raw resources for bibliometric studies are plagued by a lack of consistency in fied formatting for institution data. The present contribution puts forth a Natural Language Processing (NLP)-oriented method for the identification of the structures guiding corporate data and their mapping into a standardized format. The proposed unification process is based on the definition of address patterns and the ensuing application of Enhanced Finite-State Transducers (E-FST). Our procedure was tested on address formats downloaded from the INSPEC, MEDLINE and CAB Abstracts. The results demonstrate the helpfulness of the method as long as close control of errors is exercised as far as the formats to be unified. The computational efficacy of the model is noteworthy, due to the fact that it is firmly guided by the definition of data in the application domain.

Keywords: Analytical Tools, Application Domain, Bibliographic Databases, Bibliometric, Bibliometric Indicators, Bibliometric Studies, Citation, Citation Analysis, Computational, Control, Databases, Delimitation, Efficacy, Errors, Identification, Index, Information, Institutions, Management, Mapping, Medline, Model, Output, Paper, Process, Publications, Quality, Research Performance, Source, Sources, Strategies, Tools

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Full Text: [2007\Scientometrics70, 27.pdf](2007/Scientometrics70,%2027.pdf)

Abstract: Patent citation counts represent an aspect of patent quality and knowledge flow. Especially, citation data of US patents contain most valuable pieces of the information among other patents. This paper identifies the factors affecting patent citation counts using US patents belonging to Korea Institute of Science and Technology (KIST). For patent citation count model, zero-inflated models are announced to handle the excess zero data. For explanatory factors, research team characteristics, invention-specific characteristics, and geographical domain related characteristics are suggested. As results, the size of invention and the degree of dependence upon Japanese technological domain significantly affect patent citation counts of KIST.

Keywords: Analysis, Dependence, Flow, Information, Innovation, Inventors, Knowledge, Knowledge Flows, Model, Models, Paper, Quality, Regression, Research, Science, Spillovers, Technology, US

Albert, A., Granadino, B. and Plaza, L.M. (2007), Scientific and technological performance evaluation of the Spanish Council for Scientific Research (CSIC) in the field of Biotechnology. *Scientometrics*, **70** (1), 41-51.

Full Text: [2007\Scientometrics70, 41.pdf](2007/Scientometrics70,%2041.pdf)

Abstract: An evaluation of the Spanish CSIC performance in Biotechnology, as compared with those of the French CNRS and the Italian CNR, has been carried out to determine the balance between the generation of scientific knowledge and the transfer of technology. This study shows a high scientific productivity mostly in journals with moderate impact factor, a low generation of patents and an insufficient transfer of knowledge to the Spanish companies. Other indicators confirm the existence of competitive human resources in biotechnological research producing scientific knowledge of interest for the development of patents and that cooperates successfully at European level.

Keywords: Development, Evaluation, Human, Impact, Indicators, Knowledge, Performance, Productivity, Research, Science, Sectors, Transfer

Aleixandre-Benavent, R., Zurian, J.C.V., Miguel-Dasit, A., Arroyo, A.A. and Gomez, M.C. (2007), Hypothetical influence of non-indexed Spanish medical journals on the impact factor of the Journal Citation Reports-indexed journals. *Scientometrics*, **70** (1), 53-66.

Full Text: [2007\Scientometrics70, 53.pdf](2007/Scientometrics70,%2053.pdf)

Abstract: The purpose of this study is to analyze the hypothetical changes in the 2002 impact factor (IF) of the biomedical journals included in the Science Citation Index-Journal Citation Reports (SCI-JCR) by also taking into account cites coming from 83 non-indexed Spanish journals on different medical specialties. A further goal of the study is to identify the subject categories of the SCI-JCR with the largest increase in their IF, and to estimate the 2002 hypothetical impact factor (2002 HIF) of these 83 non-indexed Spanish journals. It is demonstrated that the inclusion of cites from a selection of non SCI-JCR-indexed Spanish medical journals in the SCI-JCR-indexed journals produces a slight increase in their 2002 IF, specially in journals edited in the USA and in the UK. More than half of the non-indexed Spanish journals has a higher 2002 HIF than that of the SCI-JCR-indexed journal with the lowest IF in the same subject category.

Keywords: Bias, Bibliometric Indicators, Biomedical Journals, Goal, Impact, Impact Factor, Inclusion, Information, Journal, Journals, Medical, Medical Journals, Medical Specialties, Publications, Quality, SCI, Science, Scientific Activity, Selection, Tool, UK, USA

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Full Text: [2007\Scientometrics70, 67.pdf](2007/Scientometrics70,%2067.pdf)

Abstract: Chinese herbal medicine has recently become a hot research field internationally, an increasing number of pharmaceutical researchers and scientists have dedicated themselves to such research work. Based on papers in the American Journal of Chinese Medicine from 2002 to 2004, 60% of papers published in the journal were sponsored by different institutions in the authors’ countries. This fact indicates that researchers receive sponsorship for their work, and sponsors should pay more attention on the control of the researchers to use financial support more efficiency. This study applied Analytic Hierarchy Process, AHP to evaluating the performance of sponsored Chinese herbal medicine research, and this method can help sponsors weight evaluation elements without having to change the system of every category of research. To explain the process and application of AHP, a Taiwanese case study is presented. The analytical results presented in this study, provide a reference for institutes supporting research on Chinese Herbal Medicine.

Keywords: AHP, Attention, Case Study, Chinese, Control, Efficiency, Elements, Evaluation, Institutions, Performance, Research, Research Impact, Taiwanese

? Zabala-Iturriagagoitia, J.M., Jimenez-Saez, F., Castro-Martinez, E. and Gutierrez-Gracia, A. (2007), What indicators do (or do not) tell us about Regional Innovation Systems. *Scientometrics*, **70** (1), 85-106.

Full Text: [2007\Scientometrics70, 85.pdf](2007/Scientometrics70,%2085.pdf)

Abstract: This paper analyses some of the methodologies and R&D and innovation indicators used to measure Regional Innovative Capacity in Spain for the period 1996-2000. The results suggest that the approaches examined are not sufficiently rigorous, they vary depending on the methodology and indicators employed. Therefore, we would suggest that the right balance between quantitative and qualitative approaches could produce a better evaluation of innovation system performance which would be more useful to policy makers and other stakeholders.

Keywords: Evaluation, Indicators, Methodology, Nations, Paper, Performance, Policy, Qualitative, Spain

? Guan, J.C. and Ma, N. (2007), A bibliometric study of China’s semiconductor literature compared with other major Asian countries. *Scientometrics*, **70** (1), 107-124.

Full Text: [2007\Scientometrics70, 107.pdf](2007/Scientometrics70,%20107.pdf)

Abstract: In this paper we compare the scientific research in the semiconductor-related field in China with some other major nations in Asia. It is based on the bibliometric information from SCI-Expanded database during the time period of 1995-2004. We show that China has been developing fast in semiconductor research, and become the second productive country in Asia as reflected by the publication profile. The evidences indicate a significant increasing trend in the research efforts and readership among Asian countries. Similar to the scientists in Japan and South Korea, Chinese scientists were more inclined to work in larger groups, typically 4 or more authors. The assessment of research quality is further conducted based on citation-based measures. As benchmarks, two western countries, namely USA and Germany, have been compared in the citation analysis. It is revealed that the impacts of research outputs in the Asian countries, except for Japan, have been badly incommensurate with their devoted research efforts compared with USA and Germany. Like most of other Asian countries the research results of Chinese scientists in semiconductor have a low international visibility despite their strong research efforts and increasingly large domestic readership. The application of Leimkuhler curve illustrates vividly the inequality of citation times among the compared countries. Furthermore, the Gini Indices of each country and each pair of countries are calculated which illustrates again the inequality of informetric productivities.

Keywords: Analysis, Asia, Asian, Assessment, Basic Research, Bibliometric, Bibliometric Study, China, Chinese, Citation, Citation Analysis, Citation Impact, Germany, GINI Index, Groups, Impacts, Indicators, Information, Japan, Journals, Korea, Low, Paper, Profile, Publication, Publication Output, Quality, Research, Research Performance, Research Quality, Research Results, Science, South Korea, Trend, USA, Visibility

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Full Text: [2007\Scientometrics70, 125.pdf](2007/Scientometrics70,%20125.pdf)

Abstract: Motivated by concerns about the organizational and institutional conditions that foster research creativity in science, we focus on how creative research can be defined, operationalized, and empirically identified. A functional typology of research creativity is proposed encompassing theoretical, methodological and empirical developments in science. We then apply this typology through a process of creative research event identification in the fields of nanotechnology and human genetics in Europe and the United States, combining nominations made by several hundred experts with data on prize winners. Characteristics of creative research in the two respective fields are analyzed, and there is a discussion of broader insights offered by our approach.

Keywords: Europe, Genetics, Human, Identification, Made, Organizational, Research, Science, Scientific Creativity, Typology, United States

? Pasterkamp, G., Rotmans, J.I., de Kleijn, D.V.P. and Borst, C. (2007), Citation frequency: A biased measure of research impact significantly influenced by the geographical origin of research articles. *Scientometrics*, **70** (1), 153-165.

Full Text: [2007\Scientometrics70, 153.pdf](2007/Scientometrics70,%20153.pdf)

Abstract: Context. The use of citation frequency and impact factor as measures of research quality and journal prestige is being criticized. Citation frequency is augmented by self-citation and for most journals the majority of citations originate from a minority of papers. We hypothesized that citation frequency is also associated with the geographical origin of the research publication. Objective. We determined whether citations originate more frequently from institutes that are located in the same country as the authors of the cited publication than would be expected by chance. Design. We screened citations referring to 1200 cardiovascular publications in the 7 years following their publication. For the 1200 citation recipient publications we documented the country where the research originated (9 countries/regions) and the total number of received citations. For a selection of 8864 citation donor papers we registered the country/region where the citing paper originated. Results. Self-citation was common in cardiovascular journals (n = 1534, 17.8%). After exclusion of self-citation, however, the number of citations that originated from the same country as the author of the citation recipient was found to be on average 31.6% higher than would be expected by chance (p < 0.01 for all countries/regions). In absolute numbers, nation oriented citation bias was most pronounced in the USA, the country with the largest research output (p < 0.001). Conclusion. Citation frequency was significantly augmented by nation oriented citation bias. This nation oriented citation behaviour seems to mainly influence the cumulative citation number for papers originating from the countries with a larger research output.

Keywords: Bias, Cardiovascular, Impact, Journal Impact, Output, Paper, Quality, Research, Research Articles, Research Quality, Science, Selection, USA

? Egghe, L. (2007), Probabilities for encountering genius, basic, ordinary or insignificant papers based on the cumulative nth citation distribution. *Scientometrics*, **70** (1), 167-181.

Full Text: [2007\Scientometrics70, 167.pdf](2007/Scientometrics70,%20167.pdf)

Abstract: This article calculates probabilities for the occurrence of different types of papers such as genius papers, basic papers, ordinary papers or insignificant papers. The basis of these calculations are the formulae for the cumulative n(th) citation distribution, being the cumulative distribution of times at which articles receive their n(th) (n = 1,2,3,...) citation. These formulae (proved in previous papers) are extended to allow for different aging rates of the papers. These new results are then used to define different importance classes of papers according to the different values of n, in function of time t. Examples are given in case of a classification into four parts: genius papers, basic papers, ordinary papers and (almost) insignificant papers. The fact that, in these examples, the size of each class is inversely related to the importance of the journals in this class is proved in a general mathematical context in which we have an arbitrary number of classes and where the threshold values of n in each class are defined according to the natural law of Weber-Fechner.

Keywords: Aging, Classification, Distribution, Importance, Law, Natural, Sleeping Beauties, Threshold

? Lo, S.C. (2007), Patent analysis of genetic engineering research in Japan, Korea and Taiwan. *Scientometrics*, **70** (1), 183-200.

Full Text: [2007\Scientometrics70, 183.pdf](2007/Scientometrics70,%20183.pdf)

Abstract: The aim of this study is to reveal the research growth, the distribution of research productivity and impact of genetic engineering research in Japan, Korea and Taiwan by taking patent bibliometrics approach. This study uses quantitative methods adopt from bibliometrics to analyze the patents granted to Japan, Korea and Taiwan by United States Patent and Trademark Office (USPTO) from 1991 to 2002. In addition to patent and citation count, Bradford’s Law is applied to identify core assignees in genetic engineering. Patent coupling approach is taken to further analyze the patents granted to the core assignees to enclose the correlations among the core assignees. 13,055 genetic engineering patents were granted during the period of 1991 to 2002. Japan, Korea and Taiwan own 841 patents and Japan owns most of them. 270 assignees shared 841 patents and 16 core assignees are identified by the Bradford’s Law. 18,490 patents were cited by the 13,055 patents and 1,146 out of the 18,490 cited patents were granted to Japan, Korea and Taiwan. The results show Japan performs best in productivity and research impact among three countries. The core assignees are also Japan based institutions and four technical clusters are identified by patent coupling.

Keywords: Analysis, Bibliometrics, Biotechnology, Citation, Clusters, Core, Correlations, Coupling, Distribution, Engineering, Genetic, Genetic Engineering, Growth, Impact, Indicators, Institutions, Japan, Knowledge, Korea, Methods, Patents, Productivity, Research, Research Productivity, Scientific Papers, Sectors, Statistics, Taiwan, United States

? Schubert, A. (2007), Successive h-indices. *Scientometrics*, **70** (1), 201-205.

Full Text: [2007\Scientometrics70, 201.pdf](2007/Scientometrics70,%20201.pdf)

Abstract: It is suggested that h-indices themselves may form the basis of a series of h-indices at successively higher levels of aggregation. The concept of successive h-indices may usefully contribute to develop a coherent frame for multi-level assessments.

Keywords: Aggregation, Assessments, Concept, Levels

? Leydesdorff, L. and Meyer, M. (2007), The scientometrics of a Triple Helix of university-industry-government relations (Introduction to the topical issue). *Scientometrics*, **70** (2), 207-222.

Full Text: [2007\Scientometrics70, 207.pdf](2007/Scientometrics70,%20207.pdf)

Abstract: We distinguish between an internal differentiation of science and technology that focuses on instrumentalities and an external differentiation in terms of the relations of the knowledge production process to other social domains, notably governance and industry. The external contexts bring into play indicators and statistical techniques other than publications, patents, and citations. Using regression analysis, for example, one can examine the importance of knowledge and knowledge spill-over for economic development. The relations can be expected to vary among nations and regions. The field-specificity of changes is emphasized as a major driver of the research agenda. In a knowledge-based economy, institutional arrangements can be considered as support structures for cognitive developments.

Keywords: Analysis, Base, Changes, Citations, Development, Economic Development, Indicators, Innovation, Knowledge, Nations, Patents, Publications, Regression Analysis, Relations, Research, Research Agenda, Science, Science and Technology, Scientometrics, Systems, Techniques, Technology, Topical

? Wong, P.K. and Ho, Y.P. (2007), Knowledge sources of innovation in a small open economy: The case of Singapore. *Scientometrics*, **70** (2), 223-249.

Full Text: [2007\Scientometrics70, 223.pdf](2007/Scientometrics70,%20223.pdf)

Abstract: By tracing the flows of patent citation to prior patents and scientific journal articles, we investigate the sources of knowledge for innovation output in Singapore, a small, highly open economy that has traditionally been significantly dependent on foreign multinational corporations (MNCs). We found that the local production of new knowledge by indigenous Singaporean firms depends disproportionately on *technological* knowledge produced by MNCs with operational presence in Singapore and *scientific* knowledge generated by foreign universities. Locally produced new knowledge by indigenous firms and local universities/ public research institutes constitutes an as yet insignificant, albeit growing, source for innovation in Singapore.

? Azagra-Caro, J.M., Archontakis, F. and Yegros-Yegros, A. (2007), In which regions do universities patent and publish more? *Scientometrics*, **70** (2), 251-266.

Full Text: [2007\Scientometrics70, 251.pdf](2007/Scientometrics70,%20251.pdf)

Abstract: The main objective of this contribution is to test whether university patents share common determinants with university publications at regional level. We build some university production functions with 1,519 patents and 180,239 publications for the 17 Spanish autonomous regions (NUTS-2) in a time span of 14 years (1988-2001). We use econometric models to estimate their determinants. Our results suggest that there is little scope for regional policy to compensate the production of patents vs. publications through different university or joint research institutional settings. On the contrary, while patents are more reactive to expenditure on R&D, publications are more responsive to the number of researchers, so the sustained promotion of both will make it compatible for regions their joint production. However, standing out in the generation of both outputs requires costly investment in various inputs.

Keywords: Economics, Growth, Innovation, Inputs, Models, Policy, Production, Regional, Research, Research Productivity, Science, Systems, Technology-Transfer, United-States

? Glänzel, W. and Schlemmer, B. (2007), National research profiles in a changing Europe (1983-2003) - An exploratory study of sectoral characteristics in the Triple Helix. *Scientometrics*, **70** (2), 267-275.

Full Text: [2007\Scientometrics70, 267.pdf](2007/Scientometrics70,%20267.pdf)

Abstract: Eight Eastern European countries joined the European Union in 2004. In this paper, bibliometric methods are used to analyse if the integration of these countries into the EU was accompanied by corresponding changes in their sectoral research profiles. In addition, the authors discuss changes in the national profiles of three accession countries and three EU15 member states during the last two decades. The results confirm that a process of European homogenisation and convergence is taking place, but also show that this process is slow and that member countries have maintained their individual peculiarities and preferences during this evolution.

Keywords: Bibliometric, Bibliometric Methods, Characteristics, EU, Europe, European Union, Evolution, Integration, Methods, Paper, Process, Profiles, Research

? Bhattacharya, S. and Arora, P. (2007), Industrial linkages in Indian universities: What they reveal and what they imply? *Scientometrics*, **70** (2), 277-300.

Full Text: [2007\Scientometrics70, 277.pdf](2007/Scientometrics70,%20277.pdf)

Abstract: The study investigated industrial interactions in science and ‘applied science’ departments of seven universities in India. Motivating factors and constraints perceived by university departments and the role of the government in initiating and sustaining interactions were examined. Different types of interactions with industry were exhibited in the seven selected universities. Some specific initiatives like creation of special centers to facilitate interaction with industry were observed in the majority of the selected universities. Personal contact was indicated as the major motivator in the initiation of linkages. The government had taken some important initiatives to strengthen the university-industry link. The study points to the need of developing further linkages so that they can lead to successful and mutually beneficial outcomes for both university and industry.

Keywords: Creation, India, Industrial, Interaction, Interactions, Lead, Science, Spillovers

? Belkhodja, O. and Landry, R. (2007), ‘The Triple-Helix collaboration: Why do researchers collaborate with industry and the government? What are the factors that influence the perceived barriers?’. *Scientometrics*, **70** (2), 301-332.

Full Text: [2007\Scientometrics70, 301.pdf](2007/Scientometrics70,%20301.pdf)

Abstract: This paper addresses four questions: What is the extent of the collaboration between the natural sciences and engineering researchers in Canadian universities and government agencies and industry? What are the determinants of this collaboration? Which factors explain the barriers to collaboration between the university, industry and government? Are there similarities and differences between the factors that explain collaboration and the barriers to collaboration? Based on a survey of 1554 researchers funded by the Natural Sciences and Engineering Research Council of Canada (NSERC), the results of the multivariate regressions indicate that various factors explain the decision of whether or not to collaborate with industry and the government. The results also differed according to the studied fields. Overall, the results show that the variables that relate to the researcher’s strategic positioning, to the set- up of strategic networks, to the costs related to the production of the transferred knowledge and transactions explain in large part the researcher’s collaboration. The results of the linear regression pointed to various factors that affect collaboration with researchers: research budget, university localization, radicalness of research, degree of risk-taking culture and researcher’s publications. Finally, the last part of the paper presents the results, and what they imply for future research and theory building.

Keywords: Barriers, Budget, Building, Canada, Costs, Culture, Knowledge, Multivariate, Natural, Paper, Production, Research, Risk-Taking, Science, Scientific Co-Authorship, Survey, University

? Baldini, N., Grimaldi, R. and Sobrero, M. (2007), To patent or not to patent? A survey of Italian inventors on motivations, incentives, and obstacles to university patenting. *Scientometrics*, **70** (2), 333-354.

Full Text: [2007\Scientometrics70, 333.pdf](2007/Scientometrics70,%20333.pdf)

Abstract: This paper reports results from a survey of 208 Italian faculty members, inventors of university-owned patents, on their motivation to get involved in university patenting activities, the obstacles that they faced, and their suggestions to foster the commercialization of academic knowledge through patents. Findings show that respondents get involved in patenting activities to enhance their prestige and reputation, and look for new stimuli for their research, personal earnings do not represent a main incentive. University-level patent regulations reduce the obstacles perceived by inventors, as far as they signal universities’ commitment to legitimate patenting activities. Implications for innovation policies are discussed.

Keywords: Academic Knowledge, Bayh-Dole Act, Biotechnology, Commercialization, Commitment, Entrepreneurial, Incentives, Intellectual Property, Knowledge, Motivation, Paper, Public Research, Research, Research-And-Development, Science, Survey, Technology-Transfer

? Moutinho, P.S.F., Fontes, M. and Godinho, M.M. (2007), Do individual factors matter? A survey of scientists’ patenting in Portuguese public research organisations. *Scientometrics*, **70** (2), 355-377.

Full Text: [2007\Scientometrics70, 355.pdf](2007/Scientometrics70,%20355.pdf)

Abstract: This paper addresses scientists’ behaviour regarding the patenting of knowledge produced in universities and other public sector research organisations (PSROs). Recent years have witnessed a rapid growth in patenting and licensing activities by PSROs. We argue that the whole process depends to a certain extent on scientists’ willingness to disclose their inventions. Given this assumption, we conduct research into individual behaviour in order to understand scientists’ views concerning the patenting of their research results. Data from a questionnaire survey of Portuguese researchers from nine PSROs in life sciences and biotechnology is presented and analysed and complemented with in-depth interviews. The results reveal that overall the scientists surveyed show a low propensity to become involved in patenting and licensing activities, despite the fact that the majority had no ‘ethical’ objections to the disclosure of their inventions and the commercial exploitation of these. Perceptions about the impacts of these activities on certain fundamental aspects of knowledge production and dissemination are however divergent. This may account for the low participation levels. Furthermore, most scientists perceived the personal benefits deriving from this type of activity to be low. Similarly, the majority also believed that there are many difficulties associated with the patenting process and that they receive limited support from their organisations, which lack the proper competences and structures to assist with patenting and licensing.

Keywords: Academia, Activity, Biotechnology, Economics, Growth, Impacts, Knowledge, Levels, Life, Matter, Paper, Participation, Performance, Production, Questionnaire, Questionnaire Survey, Research, Science, Survey, Systems, Technology, Universities

? Cassiman, B., Glenisson, P. and Van Looy, B. (2007), Measuring industry-science links through inventor-author relations: A profiling methodology. *Scientometrics*, **70** (2), 379-391.

Full Text: [2007\Scientometrics70, 379.pdf](2007/Scientometrics70,%20379.pdf)

Abstract: In this pilot study we examine the performance of text-based profiling in recovering a set of validated inventor-author links. In a first step we match patents and publications solely based on their similarity in content. Next, we compare inventor and author names on the highest ranked matches for the occurrence of name matches. Finally, we compare these candidate matches with the names listed in a validated set of inventor-author names. Our text-based profile methodology performs significantly better than a random matching of patents and publications, suggesting that text-based profiling is a valuable complementary tool to the name searches used in previous studies.

Keywords: Matching, Methodology, Performance, Profile

? Iversen, E.J., Gulbrandsen, M. and Klitkou, A. (2007), A baseline for the impact of academic patenting legislation in Norway. *Scientometrics*, **70** (2), 393-414.

Full Text: [2007\Scientometrics70, 393.pdf](2007/Scientometrics70,%20393.pdf)

Abstract: As the commercialization of academic research has risen as a target area in many countries, the need for better empirical data collection to evaluate policy changes on this front has increasingly been recognized. This need is exemplified in the Norwegian case where legislative changes went into effect in 2003 expressly to encourage greater commercialization through patenting research results. This policy ambition faces the problem that no record of the patenting activity of academic researchers is available before 2003 when the country’s ‘professor’s privilege’ was phased out. This article addresses the fundamental difficulty of how to empirically test the effect of such policy aims. It develops a methodology which can be used to reliably baseline changes in the extent and focus of academic patents. The purpose is to describe the empirical approach and results, while also providing insight into the changes in Norwegian policy on this front and their context.

Keywords: Activity, Data Collection, Entrepreneurial, Evolution, Front, Impact, Industry, Inventors, Methodology, Norway, Performance, Policy, Research, Science, Technology, Triple-Helix, University

? Meyer, M.S. and Tang, P. (2007), Exploring the ‘value’ of academic patents: IP management practices in UK universities and their implications for Third-Stream indicators. *Scientometrics*, **70** (2), 415-440.

Full Text: [2007\Scientometrics70, 415.pdf](2007/Scientometrics70,%20415.pdf)

Abstract: Third-Stream activities have become increasingly important in the UK. However, valuing them in a meaningful way still poses a challenge to science and technology analysts and policy makers alike. This paper reviews the general literature on ‘patent value’ and assesses the extent to which these established measures, including patent citation, patent family, renewal and litigation data, can be applied to the university context. Our study examines indicators of patent value for short and mid-term evaluation purposes, rather than indicators that suffer from long time lags. We also explore the extent to which differences in IP management practices at universities may have an impact on the validity and robustness of possible indicators. Our observations from four UK universities indicate that there are considerable differences between universities as to how they approach the IP management process, which in turn has implications for valuing patents and how they track activity in this area. In their current form, data as collected by universities are not sufficiently robust to serve as the basis for evaluation or resource allocation.

Keywords: Activity, Evaluation, Family, Impact, Indicators, Innovation, Litigation, Management, Management Practices, Paper, Policy, Resource Allocation, Reviews, Robustness, Science, Semiconductor Industry, Systems, Technology, UK, Validity

? Van Looy, B., Magerman, T. and Debackere, K. (2007), Developing technology in the vicinity of science: An examination of the relationship between science intensity (of patents) and technological productivity within the field of biotechnology. *Scientometrics*, **70** (2), 441-458.

Full Text: [2007\Scientometrics70, 441.pdf](2007/Scientometrics70,%20441.pdf)

Abstract: In this paper we investigate-at a country level-the relationship between the science intensity of patents and technological productivity, taking into account differences in terms of scientific productivity. The number of non patent references in patents is considered as an approximation of the science intensity of technology whereas a country’s technological and scientific performance is measured in terms of productivity (i.e., number of patents and publications per capita). We use USPTO patent-data pertaining to biotechnology for 20 countries covering the time period 1992-1999. Our findings reveal mutual positive relationships between scientific and technological productivity for the respective countries involved. At the same time technological productivity is associated positively with the science intensity of patents. These results are confirmed when introducing time effects. These observations corroborate the construct validity of science intensity as a distinctive indicator and suggest its usefulness for assessing science and technology dynamics.

Keywords: Alliances, Citation Analysis, Dynamics, Effects, Exploration, Indicator, Indicators, Industry-Government Relations, Innovation, Linkage, Paper, Performance, Productivity, Public Science, References, Science, Triple-Helix, Validity

? Ramlogan, R., Mina, A., Tampubolon, G. and Metcalfe, J.S. (2007), Networks of knowledge: The distributed nature of medical innovation. *Scientometrics*, **70** (2), 459-489.

Full Text: [2007\Scientometrics70, 459.pdf](2007/Scientometrics70,%20459.pdf)

Abstract: Innovation in medicine is a complex process that unfolds unevenly in time and space. It is characterised by radical uncertainty and emerges from innovation systems that can hardly be comprehended within geographical, technological or institutional boundaries. These systems are instead highly distributed across countries, competences and organisations. This paper explores the nature, rate and direction of the growth and transformation of medical knowledge in two specific areas of research, interventional cardiology and glaucoma. We analyse two large datasets of bibliometric information extracted from ISI and adopt an empirical network approach to try to uncover the fine structure of the relevant micro-innovation systems and the mechanisms through which these evolve along trajectories of change shaped by the search for solutions to interdependent problems.

Keywords: Bibliometric, Biotechnology, Cardiology, Collaboration, Complex, Connectivity, Fine Structure, Glaucoma, Growth, Information, Innovation, ISI, Knowledge, Mechanisms, Medical, Medicine, Paper, Process, Radical, Rate, Research, Solutions, Structure, Trajectories, Transformation, Uncertainty

? Klitkou, A., Nygaard, S. and Meyer, M. (2007), Tracking techno-science networks: A case study of fuel cells and related hydrogen technology R&D in Norway. *Scientometrics*, **70** (2), 491-518.

Full Text: [2007\Scientometrics70, 491.pdf](2007/Scientometrics70,%20491.pdf)

Abstract: This study explores boundary-crossing networks in fuel-cell science and technology. We use the case of Norwegian fuel cell and related hydrogen research to explore techno-science networks. Standard bibliometric and patent indicators are presented. Then we explore different types of network maps-maps based on co-authorship, co-patenting and co-activity data. Different network configurations occur for each type of map. Actors reach different levels of prominence in the different maps, but most of them are active both in science and technology. This illustrates that to appreciate fully the range of science-technology interplay, all three analyses need to be taken into account.

Keywords: Bibliometric, Case Study, Cells, Co-Authorship, Co-Authorships, Fuel Cell, Fuel Cells, Hydrogen, Indicators, Industry-Government Relations, Interface, Knowledge, Levels, Networks, Norway, Patents, Patterns, Range, Research, Research Collaboration, Science, Science and Technology, Triple-Helix, University

? Kretschmer, H., Kretschmer, U. and Kretschmer, T. (2007), Reflection of co-authorship networks in the Web: Web hyperlinks versus Web visibility rates. *Scientometrics*, **70** (2), 519-540.

Full Text: [2007\Scientometrics70, 519.pdf](2007/Scientometrics70,%20519.pdf)

Abstract: methods used in webometrics and scientometrics or informetrics are evident from the literature. Are there also similarities between scientometric and Web indicators of collaboration for possible use in technology policy making? Usually, the bibliometric method used to study collaboration is the investigation of co-authorships. In this paper, Web hyperlinks and Web visibility indicators are examined to establish their usefulness as indicators of collaboration and to explore whether similarities exist between Web-based structures and bibliographic structures. Three empirical studies of collaboration between institutions and individual scientists show that hyperlink structures at the Web don’t reflect collaboration structures collected by bibliographic data. However Web visibility indicators of collaboration are different from hyperlinks and can be successfully used as Web indicators of collaboration.

Keywords: Bibliometric, Co-Authorship, Co-Authorship Networks, Collaboration, Communication, Hyperlinks, Indicators, Informetrics, Institutions, International Scientific Collaboration, Investigation, Methods, Networks, Paper, Patterns, Policy, Policy Making, Policy-Making, Science, Scientometrics, Technology Policy, Visibility, Webometrics

? Pouris, A. (2007), Nanoscale research in South Africa: A mapping exercise based on scientometrics. *Scientometrics*, **70** (3), 541-553.

Full Text: S[2007\Scientometrics70, 541.pdf](2007/Scientometrics70,%20541.pdf)

Abstract: This article reports the findings of a scientometric analysis of nanoscale research in South Africa during the period 2000-2005. The ISI databases were identified as the most appropriate information platform for the objectives of the investigation and have been interrogated for the identification of South African authors publishing in the field. The article identifies trends over time, major institutional contributors, journals in which South African authors publish their research, international collaborators and performance in comparison to four comparator countries (India, Brazil, South Korea and Australia). The major findings of the investigation are as follows: nanoscale research in South Africa is driven by individual researchers interests up to date and it is in its early stages of development, the country’s nanoscale research is below what would one expect in light of its overall publication output, the country’s nano-research is distributed to a number of Universities with subcritical concentration of researchers.

Keywords: Africa, Analysis, Australia, Brazil, Collaboration, Comparison, Concentration, Databases, Development, Exercise, Identification, India, Information, Investigation, ISI, Journals, Korea, Light, Mapping, Nanoscale, Nanoscience, Nanotechnology, Output, Performance, Publication, Publications, Publishing, Research, Scientometrics, Sector, South Africa, South Korea, Trends

? Lin, M.W. and Zhang, J.J. (2007), Language trends in nanoscience and technology: The case of Chinese-language publications. *Scientometrics*, **70** (3), 555-564.

Full Text: [2007\Scientometrics70, 555.pdf](2007/Scientometrics70,%20555.pdf)

Abstract: Nanoscience and technology (NST) is a young scientific and technological field that has generated great worldwide interest in the past two decades. Previous bibliometric analyses have unmistakably demonstrated the remarkable growth of the global NST literature. While almost all published research articles in NST are in English, increasingly a larger share of NST publications is published in the Chinese language. Perplexingly, Chinese is the only language - apart from English - that displays an ascendant trend in the NST literature. In this brief note, we explore and evaluate three arguments that could explain this phenomenon: coverage bias, language preference, and community formation.

Keywords: Bias, Bibliometric, Brief, Chinese, Community, Developing-World, English, Formation, Global, Growth, Language, Nanoscience, Nanotechnology, Preference, Publications, Research, Research Articles, Research Performance, Science-Citation-Index, Scientific Journals, Trend, Trends

? Kostoff, R.N., Koytcheff, R.G. and Lau, C.G.Y. (2007), Global nanotechnology research metrics. *Scientometrics*, **70** (3), 565-601.

Full Text: [2007\Scientometrics70, 565.pdf](2007/Scientometrics70,%20565.pdf)

Abstract: Text mining was used to extract technical intelligence from the open source global nanotechnology and nanoscience research literature. An extensive nanotechnology/nanoscience-focused query was applied to the Science Citation Index/Social Science Citation Index (SCI/SSCI) databases. The nanotechnology/nanoscience research literature infrastructure (prolific authors, key journals/institutions/countries, most cited authors/journals/documents) was obtained using bibliometrics. A novel addition was the use of institution and country auto-correlation maps to show co-publishing networks among institutions and among countries, and the use of institution-phrase and country-phrase cross-correlation maps to show institution networks and country networks based on use of common terminology (proxy for common interests). The use of factor matrices quantified further the strength of the linkages among institutions and among countries, and validated the co-publishing networks shown graphically on the maps.

Keywords: Bibliometrics, Databases, Global, Institutions, Key, Metrics, Mining, Nanoscience, Nanotechnology, Networks, Proxy, Research, Science Citation Index, Source, Strength, T, Terminology

? Lucio-Arias, D. and Leydesdorff, L. (2007), Knowledge emergence in scientific communication: From ‘fullerenes’ to ‘nanotubes’. *Scientometrics*, **70** (3), 603-632.

Full Text: [2007\Scientometrics70, 603.pdf](2007/Scientometrics70,%20603.pdf)

Abstract: This article explores the emergence of knowledge from scientific discoveries and their effects on the structure of scientific communication. Network analysis is applied to understand this emergence institutionally as changes in the journals, semantically as changes in the codification of meaning in terms of words, and cognitively as the new knowledge becomes the emergent foundation of further developments. The discovery of fullerenes in 1985 is analyzed as the scientific discovery that triggered a process which led to research in nanotubes.

Keywords: Algorithm, Analysis, Collaboration, Communication, Effects, Emergence, Indicators, Interdisciplinarity, Knowledge, Meaning, Nanoscience, Nanotechnology, Patterns, Research, Science, Structure

? Rafols, I. and Meyer, M. (2007), How cross-disciplinary is bionanotechnology? Explorations in the specialty of molecular motors. *Scientometrics*, **70** (3), 633-650.

Full Text: [2007\Scientometrics70, 633.pdf](2007/Scientometrics70,%20633.pdf)

Abstract: Nanotechnology has been presented in the policy discourse as an intrinsically interdisciplinary field, requiring collaborations among researchers with different backgrounds, and specific funding schemes supporting knowledge-integration activities. Early bibliometric studies supported this interdisciplinary vision (MEYER & PERSSON, 1998), but recent results suggest that nanotechnology is (yet) a mixed bag with various mono-disciplinary subfields (SCHUMMER, 2004). We have reexamined the issue at the research project level, carrying out five case studies in molecular motors, a specialty of bionanotechnology. Relying both in data from interviews and bibliometric indicators, we have developed a multidimensional analysis (SANZ-MENENDEZ et al., 2001) in order to explore the extent and types of cross-disciplinary practices in each project. We have found that there is a consistent high degree of cross-disciplinarity in the cognitive practices of research (i.e., use of references and instrumentalities) but a more erratic and narrower degree in the social dimensions (i.e., affiliation and researchers’ background). This suggests that cross-disciplinarity is an eminently epistemic characteristic and that bibliometric indicators based on citations and references capture more accurately the generation of cross-disciplinary knowledge than approaches tracking co-authors’ disciplinary affiliations. In the light of these findings we raise the question whether policies focusing on formal collaborations between laboratories are the most appropriate to facilitate cross-disciplinary knowledge acquisition and generation.

Keywords: Analysis, Background, Bibliometric, Bibliometric Indicators, Bibliometric Studies, Citations, Collaboration, Dynamics, Fields, Funding, Indicators, Interdisciplinarity, Interdisciplinary, Interviews, Knowledge, Knowledge Integration, Light, Multidimensional Analysis, Nanotechnology, Order, Patterns, Policy, Recent, Research, Science, Social, Technology, Tracking, Vision

? Braun, T., Zsindely, S., Diospatonyi, I. and Zador, E. (2007), Gatekeeping patterns in nano-titled journals. *Scientometrics*, **70** (3), 651-667.

Full Text: [2007\Scientometrics70, 651.pdf](2007/Scientometrics70,%20651.pdf)

Abstract: Activities on nanoscale research have seen a skyrocketting growth beginning during the nineties. This can be documented by the birth of no less than 16 science journals dedicated entirely to this field of science. The topics of these journals reflect the true interdisciplinary character of nanoscale research. In this paper the decision-makers on what and when appears in those journals, the gatekeepers, i.e., the editorial members of those journals and their national identity are analyzed and some conclusions are drawn on the decisional power of the countries these gatekeepers are located in. It came out that although the United States is still the leading power in the nanoscale research field, the EU is strongly catching up and due to intensive efforts in this directions by some Far East countries as China and Japan but also of India, Asia is nearing and in some cases even overtaking the big powers.

Keywords: Asia, China, Collaboration, EU, Growth, Identity, India, Interdisciplinarity, Interdisciplinary, Japan, Nanoscience, Nanotechnology, Paper, Research, Science, United States

? Schummer, J. (2007), The global institutionalization of nanotechnology research: A bibliometric approach to the assessment of science policy. *Scientometrics*, **70** (3), 669-692.

Full Text: [2007\Scientometrics70, 669.pdf](2007/Scientometrics70,%20669.pdf)

Abstract: Based on bibliometric methods, this paper describes the global institutionalization of nanotechnology research from the mid-1980s to 2006. Owing to an extremely strong dynamics, the institutionalization of nanotechnology is likely to surpass those of major disciplines in only a few years. A breakdown of the relative institutionalizations strengths by the main geographical regions, countries, research sectors, disciplines, and institutional types provides a very diverse picture over the time period because of different national science policies. The results allow a critical assessment of the different science policies based on the relative institutionalizations strengths as well as the conclusion that the institutionalization process has run out of control of individual governments who once induced the development.

Keywords: Assessment, Bibliometric, Bibliometric Methods, Breakdown, Control, Development, Dynamics, Global, Methods, Nanotechnology, Paper, Policy, Process, Research, Science, Science Policy, Science-Policy, Strengths

? Leydesdorff, L. and Zhou, P. (2007), Nanotechnology as a field of science: Its delineation in terms of journals and patents. *Scientometrics*, **70** (3), 693-713.

Full Text: [2007\Scientometrics70, 693.pdf](2007/Scientometrics70,%20693.pdf)

Abstract: The Journal Citation Reports of the Science Citation Index 2004 were used to delineate a core set of nanotechnology journals and a nanotechnology-relevant set. In comparison with 2003, the core set has grown and the relevant set has decreased. This suggests a higher degree of codification in the field of nanotechnology: the field has become more focused in terms of citation practices. Using the citing patterns among journals at the aggregate level, a core group of ten nanotechnology journals in the vector space can be delineated on the criterion of betweenness centrality. National contributions to this core group of journals are evaluated for the years 2003, 2004, and 2005. Additionally, the specific class of nanotechnology patents in the database of the U. S. Patent and Trade Office (USPTO) is analyzed to determine if non-patent literature references can be used as a source for the delineation of the knowledge base in terms of scientific journals. The references are primarily to general science journals and letters, and therefore not specific enough for the purpose of delineating a journal set.

Keywords: Aggregate, Algorithm, Centrality, Core, Group, Indicators, Knowledge, Knowledge Base, Patterns, Science, Source, Technology, Trends

? Wong, P.K., Ho, Y.P. and Chan, C.K. (2007), Internationalization and evolution of application areas of an emerging technology: The case of nanotechnology. *Scientometrics*, **70** (3), 715-737.

Full Text: [2007\Scientometrics70, 715.pdf](2007/Scientometrics70,%20715.pdf)

Abstract: Nanotechnology patenting has grown rapidly in recent years as an increasing number of countries are getting into the global nanotechnology race. Using a refined methodology to identify and classify nanotechnology patents, this paper analyses the changing pattern of internationalization of nanotechnology patenting activities from 1976-2004. We show that the dominance of the G5 countries have declined in recent years, not only in terms of quantity, but also in terms of quality as measured by citation indicators. In addition, using a new approach to classifying the intended areas of commercial applications, we show that nanotechnology patenting initially emphasized instrumentation, but exhibited greater diversification to other application areas in recent years. Significant differences in application area specialization are also found among major nanotechnology nations. Moreover, universities are found to play a significant and increasing role in patenting, particularly in US, UK and Canada.

Keywords: Applications, Canada, Collaboration, Country, Evolution, Field, Global, Indicators, Institution, Instrumentation, Interdisciplinarity, Methodology, Nanoscience, Paper, Patents, Patterns, Quality, Quantity, Race, Recent, Role, Science, UK, US

? Hullmann, A. (2007), Measuring and assessing the development of nanotechnology. *Scientometrics*, **70** (3), 739-758.

Full Text: [2007\Scientometrics70, 739.pdf](2007/Scientometrics70,%20739.pdf)

Abstract: Nanotechnology merits having a major impact on the world economy because its applications will be used in virtually all sectors. Scientists, researchers, managers, investors and policy makers worldwide acknowledge this huge potential and have started the nano-race. The purpose of this paper is to analyse the state of the art of nanotechnology from an economic perspective, by presenting data on markets, funding, companies, patents and publications. It will also raise the question of how much of the nano-hype is founded on economic data and how much is based on wishful thinking. It focuses on a comparison between world regions, thereby concentrating on Europe and the European Union in relation to their main competitors - the United States and Japan and the emerging ‘nano-powers’ China and Russia.

Keywords: Applications, China, Development, Economic, Economy, Europe, European Union, Impact, Japan, Paper, Policy, Russia, Thinking, United States

? Kuusi, O. and Meyer, M. (2007), Anticipating technological breakthroughs: Using bibliographic coupling to explore the nanotubes paradigm. *Scientometrics*, **70** (3), 759-777.

Full Text: [2007\Scientometrics70, 759.pdf](2007/Scientometrics70,%20759.pdf)

Abstract: There is general consensus that the field of nanotechnology will be very important in the future. An open question is, however, which technological approaches or paradigms will be important in the field. The paper assumes that the carbon nanotube will be a key element of an emerging technological paradigm in nanotechnology. This study employs a bibliometric method - bibliographic coupling - to identify important nanotubes-related ‘leitbilder’ - a concept meaning ‘guiding images’ that provide a basis for different professions and disciplines to work in the same direction. Until recently, bibliographic coupling has been applied rarely for purposes of research evaluation, not to mention technology foresight. Our case study seems to suggest that bibliographic coupling is particularly suitable for anticipating technological breakthroughs. Bibliographic coupling analysis of recent nanotube-related patents focused our attention to recent patents owned by Nantero Inc. Nantero’s main focus is the development of NRAM - a high-density nonvolatile random access memory. The NRAM leitbild seems to be an important emerging leitbild. It connects technical opportunities and promising applications relating to the memories in devices such as cell phones, MP3 players, digital cameras, as well as applications in networking arena.

Keywords: Access, Analysis, Applications, Attention, Bibliometric, Carbon, Carbon Nanotube, Case Study, Cocitation, Concept, Consensus, Coupling, Development, Documents, Evaluation, General, Indicators, Key, Meaning, Memory, Nanotechnology, Paper, Patents, Recent, Research, Research Evaluation, Science

? Meyer, M. (2007), What do we know about innovation in nanotechnology? Some propositions about an emerging field between hype and path-dependency. *Scientometrics*, **70** (3), 779-810.

Full Text: [2007\Scientometrics70, 779.pdf](2007/Scientometrics70,%20779.pdf)

Abstract: This contribution formulates a number of propositions about the emergence of novel nanoscience and nanotechnology (N&N). Seeking to complement recent work that aims to define a research agenda and draws on general insights from the innovation literature, this paper aims to synthesize knowledge from innovation-related studies of the N&N field. More specifically, it is suggested that N&N is often misconstrued as either a field of technology or an area of (broadly) converging technologies while evidence to date suggests rather that N&N be considered a set of inter-related and overlapping about not necessarily merging technologies. The role of instrumentation in connecting the various N&N fields is underlined. Finally, the question is raised whether change in N&N tends to be incremental rather than discontinuous, being the result of technological path-dependencies and lock-ins in industry-typical search regimes that are only slowly giving way to more boundary-crossing activities.

Keywords: Collaboration, Directions, Domains, Emergence, Exploration, Instrumentation, Interdisciplinarity, Knowledge, Nano-Science, Nanoscience, Paper, Patterns, Recent, Research, Role, Technical Change, Technology

? Heinze, T. and Bauer, G. (2007), Characterizing creative scientists in nano-S&T: Productivity, multidisciplinarity, and network brokerage in a longitudinal perspective. *Scientometrics*, **70** (3), 811-830.

Full Text: [2007\Scientometrics70, 811.pdf](2007/Scientometrics70,%20811.pdf)

Abstract: While some believe that publication and citation scores are key predictors of breakthroughs in science, others claim that people who work at the intersection of scientific communities are more likely to be familiar with selecting and synthesizing alternatives into novel ideas. This paper contributes to this controversy by presenting a longitudinal comparison of highly creative scientists with equally productive researchers. The sample of creative scientists is identified by combining information on science awards and nominations by international peers covering research accomplishments in the mid-1990s. Results suggest that it is not only the sheer quantity of publications that causes scientists to produce creative pieces of work. Rather, their ability to effectively communicate with otherwise disconnected peers and to address a broader work spectrum also enhances their chances to be widely cited and to develop novel ideas.

Keywords: Communities, Information, Key, Longitudinal, Nanotechnology, Paper, Performance, Predictors, Quantity, Research, Science

? Robinson, D.K.R., Ruivenkamp, M. and Rip, A. (2007), Tracking the evolution of new and emerging S&T via statement-linkages: Vision assessment in molecular machines. *Scientometrics*, **70** (3), 831-858.

Full Text: [2007\Scientometrics70, 831.pdf](2007/Scientometrics70,%20831.pdf)

Abstract: The past 10 years has seen an explosion of interest for the area of science and technology labelled ‘nanotechnology.’ Although at an early stage, nanotechnology is providing a space for the creation of new alliances and the forging of new ties in many actor arenas, initiated based on promises and high expectations of the fruits that could be harvested from development and investment into nanotechnology. Those trying to characterise the dynamics of emerging ties and networks within this field are faced with a number of complexities which are characteristic of the nanotechnology umbrella term, which covers many technologies, various mixes of disciplines and actors, and ongoing debates about definitions of fields and terminology. In this paper we explore an approach for capturing dynamics of emergence of a particular area of nanotechnology by investigating visions of possible futures in relation to molecular mechanical systems (molecular machines). The focus of this text is to outline an approach used to map and analyse visions in an emerging field by taking as the unit of analysis linkages made in statements in texts, and the agglomeration of linkages around certain nodes. Taking the linkage, rather than node, allows one to probe deeper into the dynamics of emergence at early stages when definitions and meanings of certain words/nodes are in flux and patterns of their use change dramatically over short periods of time. As part of a larger project on single and macromolecular machines we explore the dynamics of visions in the field of molecular machines with the eventual aim to elucidate the shaping strength of visions within nanotechnology.

Keywords: Analysis, Assessment, Creation, Development, Dynamics, Economics, Emergence, Evolution, Expectations, Flux, Futures, Made, Motors, Paper, Science, Sociology, Technology, Terminology

? Bassecoulard, E., Lelu, A. and Zitt, M. (2007), Mapping nanosciences by citation flows: A preliminary analysis. *Scientometrics*, **70** (3), 859-880.

Full Text: [2007\Scientometrics70, 859.pdf](2007/Scientometrics70,%20859.pdf)

Abstract: This article presents a citation-based mapping exercise in the nanosciences field and a first sketch of citation transactions (a measure of cognitive dependences). Nanosciences are considered to be one of the ‘convergent’ components shaping the future of science and technology. Recurrent questions about the structure of the field concern its diversity and multi- or inter-disciplinarity. Observations made from various points of view confirm a strong differentiation of the field, which is scattered in multiple galaxies with moderate level of exchanges. The multi-disciplinarity of themes and super-themes detected by mapping also appears moderate, most of the super-themes being based on physics and chemistry in various proportions. Structural analysis of the list of references in articles suggests that the moderate multi-disciplinarity observed at the aggregate level partly stems from an actual inter-disciplinarity at the article level.

Keywords: Aggregate, Analysis, Cocitation, Collaboration, Differentiation, Diversity, Exercise, Flows, Indicators, Interdisciplinarity, Made, Mapping, Modern Science, Nanotechnology, Patterns, Science, Structure

? Bailón-Moreno, R., Jurado-Alameda, E., Ruiz-Baños, R., Courtial, J.P. and Jimenez-Contreras, E. (2007), The pulsing structure of science: Ortega y Gasset, Saint Matthew, fractality and transfractality. *Scientometrics*, **71** (1), 3-24.

Full Text: [2007\Scientometrics71, 3.pdf](2007/Scientometrics71,%203.pdf)

Abstract: By a new fractal/transfractal geometry of the Unified Scientometric Model, it is possible to demonstrate that science presents an oscillating or pulsing dynamic. It goes alternatively through two types of phases. Some phases are fractal, with crystalline networks, where the Matthew effect clearly manifests itself with regard to the most notable actors and those that provide the best contributions. The other phases are transfractal, with deformed, amorphous networks, in which the actors, considered mediocre, present greater capacity to restructure the network than the more renowned actors. The result after any transfractal deformation is a new crystalline fractal network. Behind this vision lies the Kuhn paradigms. As examples, the scientific fields of surfactants and autism have been analysed.

Keywords: Amorphous, Autism, Capacity, Cocitations, Dynamic, Dynamics, Model, Networks, Science, Scientific Networks, Structure, Surfactants, Translation, Vision

? Kademani, B.S., Kumar, V., Surwase, G., Sagar, A., Mohan, L., Kumar, A. and Gaderao, C.R. (2007), Research and citation impact of publications by the chemistry division at bhabha atomic research centre. *Scientometrics*, **71** (1), 25-57.

Full Text: [2007\Scientometrics71, 25.pdf](2007/Scientometrics71,%2025.pdf)

Abstract: The paper analyses the citations to 1733 publications published during 1970-1999 by the Chemistry Division at Bhabha Atomic Research Centre, using Science Citation Index 1982-2003 as the source data. The extent of citations received, in terms of the number of citations per paper, yearwise break up of citations, domainwise citations, self-citations and citations by others, diachronous self-citation rate, citing authors, citing institutions, highly cited papers, the categories of citing documents, citing journals and distribution of citations among them etc. are determined. During 1982-2003 chemistry Division publications have received a total of 11041 citations. The average number of citations per year was 501.86. The average number of citations per publication was 6.37. The highest number of citations received were 877 in 2001. The citation rate was peaked during 1990-2003 as maximum 9145 (82.82%) citations were received during the period. Total self-citations were 3716 (33.66%) and citations by others were 7325 (66.34%). Mean diachronous self-citation rate was 36.16. Citation time lag was zero for 144 (15.52%) papers and one year for 350 (37.72%) papers. Single authored publications (168) have received 456 (4.13%) citations and 1565 multi-authored publications have received 10585 (95.87%) citations. The core citing authors were: J. P. Mittal (695) followed by V. K. Jain (524), H. Mohan (471), T. Mukherjee (307), R. M Iyer (253), H. Pal (251), J. V. Yakhmi (211), A. V. Sapre (174), D. K. Palit (161), N. M. Gupta (128), and S. K. Kulshrestha (116). Citation life cycles of four highly cited papers was discussed. The core journals citing Chemistry Division publications were: J. Phys. Chem.-A (436 citations), Chem. Phys. Lett. (372), J. Phys. Chem. (355), J. Chem. Phys. (353), J. Organomet. Chem. (285), J. Phys. Chem.-B (279), J. Photochem. Photobiol.-A (263), Langmuir (245), J. Am. Chem. Soc. (226), Physica-C (225), Radiat. Phys. Chem. (217), Inorg. Chem. (215) and Indian J. Chem.-A (207).

Keywords: Academic-Institutions, Articles, Basic Research, Bibliometric Analysis, Citation, Citations, Core, Distribution, Impact, Indicators, Institutions, Journals, Langmuir, Life, P, Paper, Performance, Publication, Publications, Quality, Rate, Research, Science Citation Index, Scientific Productivity, Source, Time Lag, Time-Lag, Uncitedness, University Departments

? Royle, J., Coles, L., Williams, D. and Evans, P. (2007), Publishing in international journals - An examination of trends in Chinese co-authorship. *Scientometrics*, **71** (1), 59-86.

Full Text: [2007\Scientometrics71, 59.pdf](2007/Scientometrics71,%2059.pdf)

Abstract: This paper examines patterns of Chinese authorship, focusing particularly on international co-authorship, in a sample of 37,526 articles from Elsevier journals published in 2004. Trends relating to potential influences such as subject, journal impact factor and article type are explored. A slightly higher proportion of articles with at least one Chinese author was observed as compared to previous studies. Articles that are a product of Chinese international collaboration account for almost 20% of the Chinese sample as a whole, a similar proportion to levels of international collaboration within the sample overall. Chinese international co-authorship is most common in the Earth & Environmental Sciences. Where China is involved in international collaboration, it is often a proactive participant: 49% of articles that are a result of Chinese international collaboration have a Chinese corresponding author. With some minor variations in subject categories, countries favoured in international co-authorship reflect world shares in publishing and factors such as geographical proximity and political links.

Keywords: Articles, Authorship, Bibliometric Indicators, Biomedical-Research, China, Chinese, Co-Authorship, Collaboration, Cooperation, Examination, Impact, Impact Factor, International Collaboration, Journal, Journals, Levels, Molecular-Biology, Networks, Paper, Publication, Publishing, Science, Scientific Collaboration, Trends

? Calero, C., Van Leeuwen, T.N. and Tijssen, R.J.W. (2007), Research cooperation within the bio-pharmaceutical industry: Network analyses of co-publications within and between firms. *Scientometrics*, **71** (1), 87-99.

Full Text: [2007\Scientometrics71, 87.pdf](2007/Scientometrics71,%2087.pdf)

Abstract: Bio-pharmaceutical R&D is increasingly an international affair. Research articles published in the peer-reviewed international scientific and technical journals represent quantifiable research outputs of bio-pharmaceutical firms. Large-scale systemic measurements of worldwide trends and sectoral patterns within bio-pharmaceutical science can be gauged from these articles, where coauthored research papers are assumed to reflect research cooperation and associated knowledge flows and exchanges. We focus our attention on the largest science-based multinational enterprises (MNEs), those that produce relatively large quantities of research articles. The study deals with the worldwide output of research articles that are co-produced by corporate researchers during the years 1996-2001. We employ these publications to examine structural factors characterizing research cooperation networks within industry at the level of major geographical regions (North America, Europe, Pacific-Asia), with a breakdown by within-MNE and between-MNE network linkages. The descriptive statistics on publication output and results of network analyses of co-publication linkages not only indicate regional differences, with a central role for US companies in biopharmaceutical research, but also a variety of firm-specific research cooperation networks which enabled us to develop a tentative typology of MNEs in terms of their intra- and interorganizational patterns of research cooperation linkages.

Keywords: Attention, Bibliometric Analysis, Breakdown, Enterprises, Europe, Flows, Journals, Knowledge, Measurements, Networks, North America, Organization, Output, Publication, Publications, Regional, Research, Research Articles, Research-and-Development, Role, Science, States, Statistics, Trends, Typology, US

? Chen, D.Z., Lin, W.Y.C. and Huang, M.H. (2007), Using essential patent index and essential technological strength to evaluate industrial technological innovation competitiveness. *Scientometrics*, **71** (1), 101-116.

Full Text: [2007\Scientometrics71, 101.pdf](2007/Scientometrics71,%20101.pdf)

Abstract: The aim of this article is to develop new patent indicators for evaluating technological innovation competitiveness between companies. A novel indicator representing an industrial’s patent performance, Essential Patent Index (EPI), was developed by incorporating information on who cited these patents and when these patents were cited, based on the assumption that both contribute to meaningful quality assessment. By combining EPI and Chi’s well known Technological Strength (TS) indicator, a second novel indicator Essential Technological Strength (ETS) was developed to represent the innovation competitiveness of an individual company. In this study, patent performance of three high-tech industries in Taiwan were analyzed using ETS as well as the traditional TS for comparison. Results from this analysis demonstrated that ETS provided better insights by clearly verifying the latent influence of citations, reinforcing the impact of essential patents, and aggrandizing the differences of innovation competitiveness between companies.

Keywords: Analysis, Assessment, Citations, ETS, Flows, Impact, Index, Indicator, Indicators, Industrial, Information, Performance, Quality, Taiwan

? Ramos, R., Royuela, V. and Surinach, J. (2007), An analysis of the determinants in Economics and Business publications by Spanish universities between 1994 and 2004. *Scientometrics*, **71** (1), 117-144.

Full Text: [2007\Scientometrics71, 117.pdf](2007/Scientometrics71,%20117.pdf)

Abstract: The objective of this study consists, firstly, of quantifying differences between Spanish universities’ output (in terms of publications and citations), and secondly, analysing its determinants. The results obtained show that there are factors which have a positive influence on these indicators, such as having a third-cycle programme, with public financing obtained in competitive selection procedures, having a large number of full-time researchers or involvement in collaborations with international institutions. However, other factors which appear to have the opposite effect were also noted. These include a higher number of students per lecturer or a lower proportion of lecturers with recognised six-year periods.

Keywords: Analysis, Constraints, Departments, Efficiency, Financing, Incentives, Indicators, Institutions, Management, Output, Productivity, Rankings, Research Output, Scientific Performance, Selection, Students, US

? Neuhaus, C., Litscher, A. and Daniel, H.D. (2007), Using scripts to streamline citation analysis on STN International. *Scientometrics*, **71** (1), 145-150.

Full Text: [2007\Scientometrics71, 145.pdf](2007/Scientometrics71,%20145.pdf)

Abstract: The database host STN International allows for extensive citation analysis in the SCISEARCH database (Science Citation Index Expanded) and in the CAplus database (Chemical Abstracts). Along with its powerful browsing, searching and analyzing facilities, STN International also features scripts. In this paper we examine the usefulness of the script language in the automation of citation analysis in SCISEARCH and CAplus.

Keywords: Analysis, Automation, Features, Language, Online Databases, Paper, Searching

? Chen, T.J., Chen, Y.C., Hwang, S.J. and Chou, L.F. (2007), The contribution of Hong Kong to China’s international scientific publications. *Scientometrics*, **71** (1), 151-154

Full Text: [2007\Scientometrics71, 151.pdf](2007/Scientometrics71,%20151.pdf)

Keywords: Clinical-Research, Gastroenterology, Hepatology, Hong Kong, Science

? Braun, T., Diospatonyi, I., Zador, E. and Zsindely, S. (2007), Journal gatekeepers indicator-based top universities of the world, of Europe and of 29 countries - A pilot study. *Scientometrics*, **71** (2), 155-178

Full Text: [2007\Scientometrics71, 155.pdf](2007/Scientometrics71,%20155.pdf)

Keywords: Europe, Science Indicators, Universities

Anuradha, K.T. and Urs, S.R. (2007), Bibliometric indicators of Indian research collaboration patterns: A correspondence analysis. *Scientometrics*, **71** (2), 179-189.

Full Text: [2007\Scientometrics71, 179.pdf](2007/Scientometrics71,%20179.pdf)

Abstract: International collaboration is becoming an increasingly significant issue in science. During the last few years, a large number of bibliometric studies of co-authorships have been reported. Mostly, these studies have concentrated on country-to-country collaboration, revealing general patterns of interaction. In this study we analyze international collaborative patterns as indicated in the Indian publications by tracking out multi author publications as given in Science Citation Index (SCI) database. Correspondence analysis is used for analysis and interpretation of the results. According to correspondence analysis of the data set, Physics, Chemistry, Clinical medicine are the first, second and third largest subjects having international collaboration. USA, Italy, Germany, France, England are the top five countries with which India is collaborating. The data set shows an association between Physics and Italy, Switzerland, Algeria, Finland, South Korea, Russia, Netherlands contrasting an association between Biology & Biochemistry, Immunology, Ecology & Environment, Geosciences, Multidisciplinary subjects and England, Japan, Canada. It also shows an association between Agriculture and Philippines, Canada, Denmark in contrast to an association between Chemistry and Malaysia, Germany, France. An association between Clinical medicine, Astrophysics and England, Sweden, USA, New Zealand in contrast to an association between Agriculture and Canada, Philippines, Denmark is shown. An association between Engineering, Mathematics, Computer Science, Neuroscience and Singapore, Canada, USA in contrast to an association between Chemistry, Astrophysics and Malaysia, Spain is shown. This association of collaborating countries and disciplines almost tallies with the publication productivity of these countries in different disciplines.

Keywords: 48 Countries, Analysis, Bibliometric, Bibliometric Studies, Canada, Collaboration, Correspondence Analysis, Denmark, England, Finland, France, General, Germany, India, Indicators, Interaction, International Collaboration, Italy, Japan, Korea, Malaysia, Medicine, New Zealand, Philippines, Productivity, Publication, Publications, Research, Research Collaboration, Russia, SCI, Science, Science Citation Index, Singapore, South Korea, Spain, Sweden, Switzerland, Tracking, USA

? Krampen, G., Becker, R., Wahner, U. and Montada, L. (2007), On the validity of citation counting in science evaluation: Content analyses of references and citations in psychological publications. *Scientometrics*, **71** (2), 191-202.

Full Text: [2007\Scientometrics71, 191.pdf](2007/Scientometrics71,%20191.pdf)

Abstract: In reference to the increasing significance of citation counting in evaluations of scientists and science institutes as well as in science historiography, it is analyzed empirically what is cited in which frequency and what types of citations in scientific texts are used. Content analyses refer to numbers of references, self-references, publication language of references cited, publication types of references cited, and type of citation within the texts. Validity of citation counting is empirically analyzed with reference to random samples of English and German journal articles as well as German textbooks, encyclopedias, and test-manuals from psychology. Results show that 25% of all citations are perfunctory, more than 50% of references are journal articles and up to 40% are books and book-chapters, 10% are self-references. Differences between publications from various psychological sub-disciplines, publication languages, and types of publication are weak. Thus, validity of evaluative citation counting is limited because at least one quarter refers to perfunctory citations exhibiting a very low information utility level and by the fact that existing citation-databases refer to journal articles only.

Keywords: Evaluation, Information, Language, Low, Motivations, Psychological, Psychology, Publication, Publications, Quality, Science, United-States, Utility, Validity

? Davis, P.M. and Fromerth, M.J. (2007), Does the arXiv lead to higher citations and reduced publisher downloads for mathematics articles? *Scientometrics*, **71** (2), 203-215.

Full Text: [2007\Scientometrics71, 203.pdf](2007/Scientometrics71,%20203.pdf)

Abstract: An analysis of 2,765 articles published in four math journals from 1997 to 2005 indicate that articles deposited in the arXiv received 35% more citations on average than non-deposited articles (an advantage of about 1.1 citations per article), and that this difference was most pronounced for highly-cited articles. Open Access, Early View, and Quality Differential were examined as three non-exclusive postulates for explaining the citation advantage. There was little support for a universal Open Access explanation, and no empirical support for Early View. There was some inferential support for a Quality Differential brought about by more highly-citable articles being deposited in the arXiv. In spite of their citation advantage, arXiv-deposited articles received 23% fewer downloads from the publisher’s website (about 10 fewer downloads per article) in all but the most recent two years after publication. The data suggest that arXiv and the publisher’s website may be fulfilling distinct functional needs of the reader.

Keywords: Access, Analysis, Functional, Impact, Lead, Publication, Recent, Support

? Sangam, S.L., Savanur, K. and Manjunath, M. (2007), Communication and collaborative research pattern of Sivaraj Ramaseshan: A scientometric portrait. *Scientometrics*, **71** (2), 217-230.

Full Text: [2007\Scientometrics71, 217.pdf](2007/Scientometrics71,%20217.pdf)

Abstract: S. Ramaseshan has contributed for the better understanding of various subjects in which he specialized during his years at the Indian Institute of Science, University of Madras and the Raman Research Institute. In this paper we would like to emphasis on his scientific contributions in various journals and some classic papers. In his entire career as a scientist he has collaborated with 47 eminent scientists and students and has published a total of 178 papers during the years 1944-2000. His field of interest has been varied and thus classified into 4 main area, i.e.: Crystallographic studies, Magneto-optics & Optics, Solid State Physics and Miscellaneous topics.

Keywords: Journals, Paper, Research, Students

? Hudson, J. (2007), Be known by the company you keep: Citations - quality or chance? *Scientometrics*, **71** (2), 231-238.

Full Text: [2007\Scientometrics71, 231.pdf](2007/Scientometrics71,%20231.pdf)

Abstract: We examine the determinants of five year citations to papers published in the American Economic Review and the Economic Journal. Citations are positively related to page length and position in the journal. Both of these variables are consistent with the hypothesis that citations reflect paper quality, as is the number of subsequent self-citations. However, the publication of a major paper, as judged by subsequent citations, significantly increases the citations of other papers in an issue and this indicates the importance of chance in determining citations.

Keywords: Economics Departments, Importance, Journals, Paper, Position, Publication, Quality, Rankings, Trends, US

? Rodriguez, V., Janssens, F., Debackere, K. and De Moor, B. (2007), Do material transfer agreements affect the choice of research agendas? The case of biotechnology in Belgium. *Scientometrics*, **71** (2), 239-269.

Full Text: [2007\Scientometrics71, 239.pdf](2007/Scientometrics71,%20239.pdf)

Abstract: In this paper we examine whether and to what extent material transfer agreements influence research agenda setting in biotechnology. Research agendas are mapped through patents, articles, letters, reviews, and notes. Three groups are sampled: (1) documents published by government and industry which used research materials received through those agreements, (2) documents published by government and industry which used in-house materials, (3) documents published by academia. Methodologically, a co-word analysis is performed to detect if there is a difference in underlying scientific structure between the first two groups of documents. Secondly, interviews with practitioners of industry and government are intended to capture their opinion regarding the impact of the signed agreements on their own research agenda choices. The existence of synchronic and diachronic common terms between co-word clusters, stemming from the first two groups of publications, suggests cognitive linkage. Moreover, interviewees generally do not consider themselves constrained in research agenda setting when signing agreements for receiving research materials. Finally, after applying a co-word analysis to detect if the first group of documents overlaps with the third group we cannot conclude that agreements signed by industry and government affect research agenda setting in academia.

Keywords: Access, Affect, Analysis, Belgium, Clusters, Co-Word Analysis, Economics, Genetic Inventions, Group, Groups, Impact, Innovation, Interviews, Materials, Models, Network, Paper, Patents, Policy, Publications, Research, Reviews, Science, Structure, Transfer

? Imperial, J. and Rodriguez-Navarro, A. (2007), Usefulness of Hirsch’s h-index to evaluate scientific research in Spain. *Scientometrics*, **71** (2), 271-282.

Full Text: [2007\Scientometrics71, 271.pdf](2007/Scientometrics71,%20271.pdf)

Abstract: The applicability of Hirsch’s h index (Hirsch, 2005) for evaluating scientific research in Spain has been investigated. A series of derivative indexes that take into account: i) the overall low scientific production in Spain before the’ 80s, ii) differences among areas due to size (overall number of citations for publications in a given area), and iii) the number of authors, are suggested. Their applicability has been tested for two different areas in the Biological Sciences. The proposed set of indexes accurately summarizes both the success and evolution of scientists’ careers in Spain, and it may be useful in the evaluation of other not well established national scientific research systems.

Keywords: Careers, Citations, Evaluation, Evolution, h Index, h-Index, Hirsch, Impact, Publications, Ranking, Research, Scientific Production, Scientific Research, Size, Spain

? Sombatsompop, N., Markpin, T., Buranathiti, T., Ratchatahirun, P., Metheenukul, T., Premkamolnetr, N. and Yochai, W. (2007), Categorization and trend of materials science research from Science Citation Index (SCI) database: A case study of ceramics, metallurgy, and polymer subfields. *Scientometrics*, **71** (2), 283-302.

Full Text: [2007\Scientometrics71, 283.pdf](2007/Scientometrics71,%20283.pdf)

Abstract: This article offers information on the characteristics and number of materials research articles indexed in the Science Citation Index (SCI) database in the year of 2004. 22,843 articles in full-text forms from 169 journals from the materials field (which included ceramics, metallurgy, and polymer journals) were retrieved from the SCI database and exported to EndNote software. The retrieved articles were carefully analyzed by eight scientists and experts in those subfields and categorized using SPSS into eight different categories, being (1) New materials, (2) Materials characterizations, (3) Materials improvement, (4) New process and/or process improvement, (5) Mathematical and theoretical models and/or computer simulations, (6) Novel and comprehensive explanations, (7) Testing conditions, and (8) Comparative studies, whose definitions were clearly indicated. The results were then considered in terms of the percentage of the number of articles in each materials subfield, country of corresponding author, and number of authors. The overall results suggested that, most materials articles published in 2004 were focused on new process and process improvement (27%), while materials characterizations (23%) and testing conditions (12%) took the 2nd and 3rd places, especially for the ceramics and polymer articles. The highest numbers of articles in the ceramics and polymer subfields were focused on new processes and/or process improvement, and those for the metallurgy subfield were on materials characterization. In the SCI database, the largest number of materials articles was authored from Asian scientists although the majority of the materials journals were run by editors from Europe in North America/Canada continents. There was no coherent relationship between the authors’ and editors’ affiliations. China, Japan and the United States of America (USA) were shown to be the top three countries which had the highest publication numbers in the materials field. Japan had the highest publication numbers in the ceramics subfield while China possessed most publications in polymer and metallurgy subfields. However, when considering the journal impact factors, the leading positions of the countries changed. The results from this work could assist materials scientists to select suitable international journals in relevant association with the contents of their to-publish works. Finally, it was noted that most material research articles were written by 3-4 authorships.

Keywords: Asian, Case Study, Ceramics, Characterization, China, Europe, Impact, Impact Factors, Information, Japan, Materials, Models, Polymer, Process, Publication, Publications, Research, Research Articles, SCI, Science, Science Research, Software, Testing, Trend, United States, USA

? Tijssen, R.J.W. (2007), Africa’s contribution to the worldwide research literature: New analytical perspectives, trends, and performance indicators. *Scientometrics*, **71** (2), 303-327.

Full Text: [2007\Scientometrics71, 303.pdf](2007/Scientometrics71,%20303.pdf)

Abstract: This paper examines general characteristics of African science from a quantitative ‘scientometric’ perspective. More specifically, that of research outputs of Africa-based authors published in the scientific literature during the years 1980-2004, either within the international journals representing ‘mainstream’ science, or within national and regional journals reflecting ‘indigenous science’. As for the international journals, the findings derived from Thomson Scientific’s Citation Indexes show that while Africa’s share in worldwide science has steadily declined, the share of international co-publications has increased very significantly, whereas low levels of international citation impact persist. A case study of South African journals reveals the existence of several journals that are not processed for these international databases but nonetheless show a distinctive citation impact on international research communities.

Keywords: Case Study, Characteristics, Citation, Communities, Databases, Developing-Countries, General, Impact, Indicators, Journals, Levels, Low, Output, Paper, Performance, Performance Indicators, Regional, Research, Science, Scientific Activity, South-Africa, Technological Capabilities, Third-World, Trends

? Pouris, A. (2007), Is fundamentalism a threat to science? Evidence from scientometrics. *Scientometrics*, **71** (2), 329-338.

Full Text: [2007\Scientometrics71, 329.pdf](2007/Scientometrics71,%20329.pdf)

Abstract: This article aims to provide scientometric evidence in order to confirm or refute the statement that the ‘rise in literalist religious thinking in the 1990s devastated science in the Islamic world by promoting the idea that all knowledge could be found in the Koran’ published in a Special Report in the New Scientist and to map the literature related to fundamentalism over time and space during the last ten years. We find that despite the rise of fundamentalism, science was thriving in eight Islamic countries (Iran, Jordan, Indonesia, Egypt, Turkey, Malaysia, Morocco, and Pakistan) during the period and hence the statement is refuted. The mapping of the ‘fundamentalist’ literature indicates that there are a constant number of articles per year (60 to 70) covering disciplines ranging from religion and sociology to political sciences and international relations. The center of research is revealed to be the Anglo-Saxon world with epicenter the USA. Finally, we identify that the debate of fundamentalism versus science is in an embryonic stage.

Keywords: Egypt, Indonesia, Iran, Jordan, Knowledge, Malaysia, Mapping, Order, Pakistan, Religion, Research, Science, Sciences, Scientometrics, South-Africa, Thinking, Turkey, USA

? Yu, G. and Li, Y.J. (2007), Parameter identification of the observed citation distribution. *Scientometrics*, **71** (2), 339-348.

Full Text: [2007\Scientometrics71, 339.pdf](2007/Scientometrics71,%20339.pdf)

Abstract: Based on the transfer function model of the observed citation distribution and the expression of the cumulative citation probability distribution, parameters of 12 citation distributions are identified from statistical data of age distributions of references of 10 journals in JCR using the parameter optimization fitting method. At same time, based on the steady state solution of differential equations of the publication delay process and data of publication delays of 10 journals, the publication delay parameters of every journal are identified using the fitting method. Identified parameters of every journal citation distribution are compared with the journal’s publication delay parameters and some valuable conclusions are deduced.

Keywords: Age, Differential, Distribution, Distributions, Function, Identification, Model, Optimization, Parameters, Probability, Process, Publication, Publication Delays, Steady-State, Transfer

? Buela-Casal, G., Gutiérrez-Martínez, O., Bermúdez-Sánchez, M.P. and Vadillo-Muñoz, O. (2007), Comparative study of international academic rankings of universities. *Scientometrics*, **71** (3), 349-365.

Full Text: [2007\Scientometrics71, 349.pdf](2007/Scientometrics71,%20349.pdf)

Abstract: International academic rankings that compare world universities have proliferated recently. In accordance with latter conceptual and methodological advances in academic rankings approaches, five selection criteria are defined and four international university rankings are selected. A comparative analysis of the four rankings is presented taking into account both the indicators frequency and its weights. Results show that, although some indicators differ considerably across selected rankings and even many indicators are unique, indicators referred to research and scientific productivity from university academic staff have a prominent role across all approaches. The implications of obtained data for main rankings consumers are discussed.

Keywords: Academic, Analysis, Comparative Analysis, Consumers, Fatal Attraction, Indicators, Journals, Productivity, Rankings, Research, Role, Scientific Productivity, Scientometrics, Selection, Universities, Weights

? Jappe, A. (2007), Explaining international collaboration in global environmental change research. *Scientometrics*, **71** (3), 367-390.

Full Text: [2007\Scientometrics71, 367.pdf](2007/Scientometrics71,%20367.pdf)

Abstract: This paper maps the domain of earth and environmental sciences (EES) and investigates the relationship between cognitive problem structures and internationalisation patterns, drawing on the concepts of systemic versus cumulative global environmental change (GEC) and mutual task dependence in scientific fields. We find that scientific output concentration and internationalisation are significantly higher in the systemic GEC fields of Meteorology & Atmospheric Sciences and Oceanography than in the cumulative GEC fields Ecology and Water Resources. The relationship is explained by stronger mutual task dependence in systemic GEC fields. In contrast, the portion of co-authorships with developing, emerging and transition countries among all international publications is larger for Water Resources than for the three other fields, consistent with the most pressing needs for STI capacity development in these countries.

Keywords: Capacity, Collaboration, Concentration, Countries, Dependence, Development, Earth, Environmental, Environmental Change, Global, International Collaboration, Output, Paper, Publications, Research, Science, Sciences, Scientific Output, Technology

? Leydesdorff, L. (2007), Mapping interdisciplinarity at the interfaces between the science citation index and the social science citation index. *Scientometrics*, **71** (3), 391-405.

Full Text: [2007\Scientometrics71, 391.pdf](2007/Scientometrics71,%20391.pdf)

Abstract: The two Journal Citation Reports of the Science Citation Index 2004 and the Social Science Citation Index 2004 were combined in order to analyze and map journals and specialties at the edges and in the overlap between the two databases. For journals which belong to the overlap (e.g., Scientometrics), the merger mainly enriches our insight into the structure which can be obtained from the two databases separately, but in the case of scientific journals which are more marginal in either database, the combination can provide a new perspective on the position and function of these journals (e.g., Environment and Planning B - Planning and Design). The combined database additionally enables us to map citation environments in terms of the various specialties comprehensively. Using the vector-space model, visualizations are provided for specialties that are parts of the overlap (information science, science & technology studies). On the basis of the resulting visualizations, ‘betweenness’ - a measure from social network analysis - is suggested as an indicator for measuring the interdisciplinarity of journals.

Keywords: Analysis, Citation, Databases, Function, Index, Indicator, Information, Information Science, Interfaces, Journal Citation Reports, Journals, Model, Network Analysis, Order, Position, Science, Science Citation Index, Scientific Journals, Social, Social Network, Social Network Analysis, Social Science Citation Index, Structure

? Ye, F.Y. (2007), A quantitative relationship between per capita GDP and scientometric criteria. *Scientometrics*, **71** (3), 407-413.

Full Text: [2007\Scientometrics71, 407.pdf](2007/Scientometrics71,%20407.pdf)

Abstract: There exists a quantitative relationship, which can be expressed as G=kF(lgP)N, where G is per capita GDP, F gross expenditure on R&D as % of GDP, P patent applications, N Internet users per 10,000 inhabitants, and k a constant ranging from 0.4 to 1.2 in most countries. The mechanism of the relationship is explained in the paper.

Keywords: Applications, GDP, Internet, Mechanism, P, Paper

Notes: CCountry

? Yaman, H. and Atay, E. (2007), PhD theses in Turkish sports sciences: A study covering the years 1988-2002. *Scientometrics*, **71** (3), 415-421.

Full Text: [2007\Scientometrics71, 415.pdf](2007/Scientometrics71,%20415.pdf)

Abstract: Aims: Undergraduate education in physical education is widely common in Turkey. Postgraduate training is provided mostly by institutes of health sciences, educational science and social sciences. The aim of this study was to evaluate the characteristics of PhD theses in sports sciences. Methods: The database of the Turkish Council of Higher Education has been searched the years 1988-2002 for PhD theses with different combinations of keywords like ‘Sport(s)’, ‘All Dissertations’ and ‘Physical Education’. Theses were classified according to the institute, year, university, the title of the mentors and the field of sports sciences. The inter-and intra-validity of ratings were high (Kendall Tau\_b=0.84 and 1.00, p < 0.01). Results: Most of theses were prepared in Institutes for Health Sciences (n=196, 86.3%), second mostly in Institutes of Social Sciences (n=25, 11.0%). Theses originated mostly from Marmara (n=90, 39.6%), Gazi (n=59, 25.9%) and Dokuz Eylul Universities (n=25, 11.0%). Ninety two theses (46.9%) were prepared in Training and Movement Sciences, 40 (20.4%) in Sports Management, 29 (14.7%) Psycho-Social Fields of Sports Sciences, 23 (11.7%) Sports Health Sciences and 13 (6.6%) in Sports Pedagogy. Conclusion: Most theses were prepared in Institutes of Health Sciences, but the subjects covered the field of training and movement sciences. The unique and multi-disciplinary nature of sports sciences seems to warrant the foundation of an Institute of Sports.

Keywords: Characteristics, Education, Health, Health Sciences, Mentors, Movement, Multidisciplinary, Physical, Science, Sciences, Social, Social Sciences, Sports, Training, Turkey

? Guerrero-Bote, V.P., Zapico-Alonso, F., Espinosa-Calvo, M.E., Gómez-Crisóstomo, R. and de Moya-Anegón, F. (2007), Import-export of knowledge between scientific subject categories: The iceberg hypothesis. *Scientometrics*, **71** (3), 423-441.

Full Text: [2007\Scientometrics71, 423.pdf](2007/Scientometrics71,%20423.pdf)

Abstract: The capacity to attract citations from other disciplines - or knowledge export - has always been taken into account in evaluating the quality of scientific papers or journals. Some of the JCR’s (ISI’s Journal Citation Report) Subject Categories have a greater exporting character than others because they are less isolated. This influences the rank, JIF (ISI’s Journal Impact Factor) distribution of the category. While all the categories fit a negative power law fairly well, those with a greater External JIF give distributions with a more sharply defined peak and a longer tail - something like an iceberg. One also observes a major relationship between the rates of export and import of knowledge.

Keywords: Capacity, Citations, Distribution, Distributions, Export, Fields, Impact, Journals, Knowledge, Law, Quality, Science System

? Junquera, B. and Mitre, M. (2007), Value of bibliometric analysis for research policy: A case study of Spanish research into innovation and technology management. *Scientometrics*, **71** (3), 443-454.

Full Text: [2007\Scientometrics71, 443.pdf](2007/Scientometrics71,%20443.pdf)

Abstract: The primary aim of this paper is to assess the contribution to the international literature of Spanish scientific production in the research stream of innovation and technology management. For this purpose 72 articles published in the last decade in the most prestigious international journals in this research stream have been evaluated. From this analysis we have concluded that there has been a positive evolution from 1995 to the present time, as much from a qualitative as from a quantitative point of view. Likewise, we have found that research in this research stream is concentrated fundamentally on a reduced group of universities. Nevertheless, these do not focus exclusively on one or a few research subjects, but on a wide range thereof.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Case Study, Empirical-Analysis, Evolution, Group, Industry, Innovation, Journals, Knowledge Management, Linking, Management, Manufacturing Firms, Operations Strategy, Paper, Policy, Production, Qualitative, Range, Research, Research Organizations, Research-and-Development, Scientific Production, Spain, Stream, Systems, Technology Management, Universities

? Om, K., Lee, J. and Chang, J. (2007), Using supply chain management to enhance industry-university collaborations in IT higher education in Korea. *Scientometrics*, **71** (3), 455-471.

Full Text: [2007\Scientometrics71, 455.pdf](2007/Scientometrics71,%20455.pdf)

Abstract: Facing such serious problems in cultivating IT engineers as a mismatch in supply and demand of IT workers, shortage of globally competitive IT professionals, and insufficient education and training of university graduates, the Korean government has decided to adopt a new paradigm in national IT engineering education, based on supply chain management (SCM) in manufacturing. SCM weights improving competitiveness of the supply chain as a whole via a long-term commitment to supply chain relationships and a cooperative, integrated approach to business processes. These characteristics of SCM are believed to provide insight into a more effective IT education and industry-university relationship. On the basis of the SCM literature, a model for industry-oriented IT higher education is designed, and then applied in the field of computer-software engineering in Korea.

Keywords: Chain, Characteristics, Commitment, Education, Effective, Government Relations, Higher Education, Innovation, Korea, Long-Term, Management, Manufacturing, Model, Supply Chain Management, Systems, Training, Triple-Helix, Weights

? Sapa, R. (2007), International contribution to library and information science in Poland: A bibliometric analysis. *Scientometrics*, **71** (3), 473-493.

Full Text: [Scientometrics71, 473](2007/Scientometrics71,%20473.pdf)

Abstract: This article reports findings from the study of the international contribution to the system of library and information science communication in Poland in the years 2003-2005. The sample consists of articles published both in selected journals and collective works. Two important dimensions determining the internationalization of local scholarly communication are considered: direct contribution (foreign authors’ articles and papers and their translations published in Poland) and indirect contribution (citedness of foreign authors’ documents in articles and papers published in Poland). Bibliographic data about the geographical distribution and affiliation of foreign authors are gathered and analyzed. Furthermore, the findings of citation analysis are presented to determine the percentage share of citations received by foreign documents as well as to find out what is the structure of such citations regarding the language and form, which thematic areas are most replete with such citations and which foreign journals are most cited in Poland.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Citation, Citation Analysis, Citations, Communication, Distribution, Impact, Information, Information Science, Journals, Language, Library and Information Science, Local, Science, Structure

? Van der Panne, G. (2007), Issues in measuring innovation. *Scientometrics*, **71** (3), 495-507.

Full Text: [2007\Scientometrics71, 495.pdf](2007/Scientometrics71,%20495.pdf)

Abstract: Innovation research builds on the analysis of micro level data describing innovative behaviour of individual firms. One increasingly popular type of data are Literature-based Innovation Output (LBIO) data. These are compiled by screening specialist trade journals for new-product announcements. Notwithstanding the substantial advantages, the eligibility of LBIO data for innovation research remains controversial. In this paper the merits of LBIO data are examined by means of comparative analysis. A newly built LBIO database is systematically compared with the widely used Community Innovation Survey. It shows that both databases identify similar innovators in terms of firm size, distribution across industries and degree of innovativeness: LBIO data can be considered a fully fledged alternative to traditional innovation data, highly eligible for innovation research.

Keywords: Analysis, Comparative Analysis, Databases, Distribution, Indicators, Innovation, Paper, Research, Screening

? Wang, S.J. (2007), Factors to evaluate a patent in addition to citations. *Scientometrics*, **71** (3), 509-522.

Full Text: [2007\Scientometrics71, 509.pdf](2007/Scientometrics71,%20509.pdf)

Abstract: The emergence of patent citations as a tool for patent estimation has been subjected to equally vocal champions and critics. In additional to patent citation, this article aims to contribute other factors, including court decisions, claim language, extension cases, patent family and portfolio, which should be deliberated during patent evaluation. It introduces the subject-matter by discussing the specialties and peculiarities of these proposed factors. Furthermore, comparisons between the patent citations and these factors are presented by illustrating several well-known patents. The results of the comparisons reveal that an adverse conclusion might be drawn if a patent is estimated only based on citations. The conclusion supports Meyer’s study that ‘the general nature of a common framework for both scientific and patent citations would severely limit its usefulness.’ Therefore, those factors discussed in the article would be a great asset in patent evaluation. However, it only illustrates their impact on patent estimation using a couple well-known patents. Future research would be needed to investigate these factors in a more detailed manner.

Keywords: Citations, Competition, Emergence, Estimation, Evaluation, Family, General, Impact, Language, Patent Citations, Patents, Research, Scientific Literature, Supports, Technology, Tell

? Payne, N. and Thelwall, M. (2007), A longitudinal study of academic webs: Growth and stabilisation. *Scientometrics*, **71** (3), 523-539.

Full Text: [2007\Scientometrics71, 523.pdf](2007/Scientometrics71,%20523.pdf)

Abstract: As the web is continuously changing, perhaps growing exponentially since its inception, a major potential problem for webometrics is that web statistics may be obsolete by the time they are published in the academic literature. It is important therefore to know as much as possible about how the web is changing over time. This paper studies the UK, Australian and New Zealand academic webs from 2000 to 2005, finding that the number of static pages and links in each of the three academic webs appears to have stabilised as far back as 2001. This stabilisation may be partly due to increases in dynamic pages which are normally excluded from webometric analyses. Nevertheless, the results are encouraging evidence that webometrics for academic spaces may have a longer-term validity than would have been previously assumed.

Keywords: Academic, Dynamic, Longitudinal, Longitudinal Study, New Zealand, Page, Paper, Site, Stabilisation, Static, Statistics, UK, Validity, Webometrics

? Braun, T., Dióspatonyi, I., Zsindely, S. and Zádor, E. (2007), Gatekeeper index versus impact factor of science journals. *Scientometrics*, **71** (3), 541-543.

Full Text: [2007\Scientometrics71, 541.pdf](2007/Scientometrics71,%20541.pdf)

Keywords: Impact, Impact Factor, Index, Science

? McMillan, G.S. and Hamilton, R.D. (2007), The public science base of US biotechnology: A citation-weighted approach. *Scientometrics*, **72** (1), 3-10.

Full Text: [2007\Scientometrics72, 3.pdf](2007/Scientometrics72,%203.pdf)

Abstract: In previous research we examined the science base of US biotechnology utilizing several unique patent and scientific paper databases (MCMILLAN et al., 2000). Our findings highlighted the importance of public science in this industry. In this current research effort, we extend that analysis to include the subsequent citations those biotechnology patents received. Our conclusions are that the reliance on public science is stable when adjusted for forward citations, but the impact of different funding sources does change when citation weights are added. The science policy implications of these findings and future research opportunities are discussed.

Keywords: Analysis, Base, Biotechnology, Citation, Citations, Current, Databases, Funding, Impact, Importance, Innovation, Paper, Patents, Policy, Policy Implications, Research, Science, Science Policy, Science-Policy, Sources, US, Weights

? Harirchi, G., Melin, G. and Etemad, S. (2007), An exploratory study of the feature of Iranian co-authorships in biology, chemistry and physics. *Scientometrics*, **72** (1), 11-24.

Full Text: [2007\Scientometrics72, 11.pdf](2007/Scientometrics72,%2011.pdf)

Abstract: This paper investigates factors behind co-authorships between scientists in Iran and elsewhere. It also compares the Iranian pattern of collaboration with other countries. A questionnaire was sent out to Iranian scientists in fields of physics, chemistry, and biology who had published an internationally co-authored journal article during 2003. The results show that not all co-authored articles were the result of a collaborative project. Also, the main collaborative motives behind the co-authorships were identified and described. Among these, we could mention sharing laboratory devices, accessing knowledge, and increased efficiency of the study at hand. It is clear that emigrated Iranian scientists play an important role as collaborators and probably also as links to the international scientific community as a whole. Cultural factors mix with scientific and work related ones. Although the proportion of international co-authorships is lower than in most other countries, the collaborative pattern seems rather similar.

Keywords: Biology, Collaboration, Community, Efficiency, Hand, Impact, International Research Collaboration, Iran, Journal, Knowledge, Motives, Paper, Questionnaire, Role, Science, Scientific Output

? Florian, R.V. (2007), Irreproducibility of the results of the Shanghai academic ranking of world universities. *Scientometrics*, **72** (1), 25-32.

Full Text: [2007\Scientometrics72, 25.pdf](2007/Scientometrics72,%2025.pdf)

Abstract: I discuss the difficulties that I encountered in reproducing the results of the Shanghai ranking of world universities. In the Shanghai ranking, the dependence between the score for the SCI indicator and the weighted number of considered articles obeys a power law, instead of the proportional dependence that is suggested by the official methodology of the ranking. Discrepancies from proportionality are also found in some of the scores for the N&S and Size indicators. This shows that the results of the Shanghai ranking cannot be reproduced, given raw data and the public methodology of the ranking.

Keywords: Academic, Dependence, Indicator, Indicators, Law, Methodology, Ranking, SCI, Universities

Alcaide-Marzal, J. and Tortajada-Esparza, E. (2007), Innovation assessment in traditional industries. A proposal of aesthetic innovation indicators. *Scientometrics*, **72** (1), 33-57.

Full Text: [2007\Scientometrics72, 33.pdf](2007/Scientometrics72,%2033.pdf)

Abstract: Innovative activities are fundamental to the competitiveness strategies of the firms in a globalized market. Their assessment, using indicators such as those utilized in the Community Innovation Survey (CIS), shows significant sectoral dispersion. Traditional industries are in a weak position because the innovation they are involved in is mainly aesthetic, which is not really addressed in innovation surveys. In this work, we review the various criticisms levelled at existing indicators and propose some new indicators that would capture the types of innovations that are conducted by the traditional industries. This work is based on a study of the features of traditional industries and the concept of aesthetic novelty. The proposed indicators are tested in the Spanish footwear industry.

Keywords: Assessment, Concept, Dispersion, Fashion, Features, Indicators, Innovation, Position, Review, Strategies, Surveys

? Rey-Rocha, J., Garzon-Garcia, B. and Martin-Sempere, M.J. (2007), Exploring social integration as a determinant of research activity, performance and prestige of scientists. Empirical evidence in the Biology and Biomedicine field. *Scientometrics*, **72** (1), 59-80.

Full Text: [2007\Scientometrics72, 59.pdf](2007/Scientometrics72,%2059.pdf)

Abstract: The aim of this paper is to explore to what extent social integration influences scientists’ research activity and performance. Data were obtained from a survey of researchers ascribed to the Biology and Biomedicine area of the Spanish Council for Scientific Research, as well as from their curricula vitae. The results provide empirical evidence that researchers who were highly integrated within their teams performed better than their less integrated colleagues in aspects of research activity such as collaboration with the private sector, patenting, participation in domestic funded research and development projects, and supervision of doctoral dissertations. Nevertheless, highly integrated researchers did not seem to be more prestigious than less integrated colleagues, nor did the former’s publications have a higher impact.

Keywords: Activity, Cohesion, Collaboration, Communication, Consolidation, Curricula, Demography, Development, Group Cohesiveness, Impact, Integration, Level, Paper, Participation, Performance, Productivity, Publications, Research, Research and Development, Social, Survey, Teams, University

? Vaughan, L., Kipp, M.E.I. and Gao, Y.J. (2007), Why are websites co-linked? The case of Canadian universities. *Scientometrics*, **72** (1), 81-92.

Full Text: [2007\Scientometrics72, 81.pdf](2007/Scientometrics72,%2081.pdf)

Abstract: This study examined why Websites were co-linked using Canadian university Websites as the test set. Pages that co-linked to these university Websites were located using Yahoo!. A random sample of 859 co-linking pages (the page that initiated the co-link) was retrieved and the contents of the page, as well as the context of the link, were manually examined to record the following variables: language, country, type of Website, and the reasons for co-linking. The study found that in over 94% of cases, the two co-linked universities were related academically, many of these cases (38%) showed a relationship specifically in teaching or research. This confirms results, from previous quantitative studies, that Web co-links can be a measure of the similarity or relatedness of sites being co-linked and that Web co-link analysis can thus be used to study relationships among linked Websites.

Keywords: Analysis, Language, Random Sample, Research, Similarity, Sites, Teaching, Test, Universities, Web

? Krauskopf, M., Krauskopf, E. and Mendez, B. (2007), Low awareness of the link between science and innovation affects public policies in developing countries: The Chilean case. *Scientometrics*, **72** (1), 93-103.

Full Text: [2007\Scientometrics72, 93.pdf](2007/Scientometrics72,%2093.pdf)

Abstract: Developing countries share disbelief about the benefits of the endogenous production of science as a tool for economical growth. Hence, public policies to strengthen science and technology and promote the culture of innovation are, in general, weak and sometimes incoherent. Patenting has become not only an icon to protect discoveries which can yield profits and enable socio-economical growth but also a potent informetric tool to assess innovation and certainly, since the seminal work of Narin, to understand the multidimensional interactions between science, technology and innovation. In this article we examine the impact of Chilean research articles on world technology as viewed by the link between articles produced in Chile and US patents. Our results show that from 1987 to 2003, 509 US patents had 562 citations to 273 articles produced at least, by one author working in a Chilean institution. US, not Chilean companies are the holders of patents citing Chilean produced articles. The research articles covered many disciplines but a clear concentration occurred in the biomedical field. Additionally, chemistry was also well cited. Our results confirm that in Chile a non-patenting culture which involves researchers and institutions still prevails. Hence, public policies need to be designed and implemented to foster scientific production and innovation in order to advance progress in the current knowledge-economy-driven society which sustains competitiveness in the globalized world.

Keywords: Awareness, Chile, Citations, Concentration, Culture, Current, Developing Countries, General, Growth, Impact, Innovation, Institutions, Interactions, Order, Patent Citations, Patents, Production, Research, Research Articles, Science, Scientific Production, Technology, US, Yield

Abt, H.A. (2007), The frequencies of multinational papers in various sciences. *Scientometrics*, **72** (1), 105-115.

Full Text: [2007\Scientometrics72, 105.pdf](2007/Scientometrics72,%20105.pdf)

Abstract: Multinational papers are defined here as ones written by authors who reside in different countries during the course of research. For each of 16 fields of science, I scanned the first 200 papers in 2005 in four major journals publishing original research papers. Those journals produced 40% of all the citations among those journals with Impact Factors greater than 1.0. The frequencies of multinational papers ranged from 13% in surgery to 55% in astronomy. Although one can list a dozen factors which might contribute toward multinational papers, I lack the data to test most of those. There are only minor correlations with team sizes and Impact Factors, inadequate to explain the range. There is a larger, but not convincing, dependence upon the fractions of single-author papers and its cause, if real, is unclear. However, the most prominent factor seems to be the nature of the objects studied, if they are usually local (e.g. in one hospital or in one laboratory), the papers tend to be domestic but if most of the objects are available simultaneously to scientists in many countries (e .g. the sky in astronomy or the oceans and the Earth’s atmosphere in geosciences or widespread diseases in the area of infectious diseases or plants and animals widely distributed in biology), the papers are often international. Auxiliary results for 2005 are an average of 5.5±0.3 authors per paper and 6.6±1.0% one-author papers.

Keywords: Atmosphere, Biology, Citations, Correlations, Course, Dependence, Diseases, Fractions, Hospital, Infectious Diseases, International Scientific Collaboration, Local, Multilateral Co-Authorship, Paper, Plants, Publishing, Range, Research, Science, Sciences, Surgery, Team, Test, Trends

? Porter, A.L., Cohen, A.S., Roessner, J.D. and Perreault, M. (2007), Measuring researcher interdisciplinarity. *Scientometrics*, **72** (1), 117-147.

Full Text: [2007\Scientometrics72, 117.pdf](2007/Scientometrics72,%20117.pdf)

Abstract: We offer two metrics that together help gauge how interdisciplinary a body of research is. Both draw upon Web of Knowledge Subject Categories (SCs) as key units of analysis. We have assembled two Substantial Web of Knowledge samples from which to determine how closely individual SCs relate to each other. ‘Integration’ measures the extent to which a research article cites diverse SCs. ‘Specialization’ considers the spread of SCs in which the body of research (e.g., the work of a given author in a specified time period) is published. Pilot results for a sample of researchers show a surprising degree of interdisciplinarity.

Keywords: Analysis, Interdisciplinary, Key, Metrics, Research, Science

? He, Z.L. and Deng, M. (2007), The evidence of systematic noise in non-patent references: A study of New Zealand companies’ patents. *Scientometrics*, **72** (1), 149-166.

Full Text: [2007\Scientometrics72, 149.pdf](2007/Scientometrics72,%20149.pdf)

Abstract: Since the pioneering studies of CARPENTER & NARIN (1983), and NARIN & NOMA (1985), non-patent references (NPRs) in patent documents have been widely used as an indicator of science-technology links. MEYER (2000) reviewed previous work in the patent citation literature and found that citation links between patents and papers are, if not explicitly, at least implicitly viewed as an indication of the contribution of science to technology. Using a sample of 850 patents of New Zealand companies granted by the USPTO between 1976 and 2004, we find evidence of systematic noise in NPR data. We suggest that future research should pay close attention to heterogeneity among countries, and that one should demonstrate more caution in applying and interpreting results based on the NPR methodology.

Keywords: Attention, Citation, Citations, Domains, Heterogeneity, Indicator, Innovation, Knowledge, Linkage, Methodology, New Zealand, Noise, Patents, Patterns, Research, Science, Technology

? Costas, R. and Iribarren-Maestro, I. (2007), Variations in content and format of ISI databases in their different versions: The case of the Science Citation index in CD-ROM and the web of science. *Scientometrics*, **72** (2), 167-183.

Full Text: [2007\Scientometrics72, 167.pdf](2007/Scientometrics72,%20167.pdf)

Abstract: The CD-ROM and web versions of the Science Citation Index databases are compared as to their content and format features. Several differences have been detected such as the use of different punctuation marks in both versions and a different organisation of author’s affiliation data. These differences make automatic comparisons of ISI products difficult and they should be considered when matching both databases. Some recommendations to ensure more normalisation and reliability of data are pointed out.

Keywords: CD-ROM, Databases, Features, Impact-Factors, Index, ISI, Matching, Products, Recommendations, Reliability, Science, Science Citation Index

? Zhou, P. and Leydesdorff, L. (2007), The citation impacts and citation environments of Chinese journals in mathematics. *Scientometrics*, **72** (2), 185-200.

Full Text: [2007\Scientometrics72, 185.pdf](2007/Scientometrics72,%20185.pdf)

Abstract: Based on the citation data of journals covered by the China Scientific and Technical Papers and Citations Database (CSTPCD), we obtained aggregated journal-journal citation environments by applying routines developed specifically for this purpose. Local citation impact of journals is defined as the share of the total citations in a local citation environment, which is expressed as a ratio and can be visualized by the size of the nodes. The vertical size of the nodes varies proportionally to a journal’s total citation share, while the horizontal size of the nodes is used to provide citation information after correction for the within-journal (self-) citations. In the ‘citing’ environment, the equivalent of the local citation performance can also be considered as a citation activity index. Using the ‘citing’ patterns as variables one is able to map how the relevant journal environments are perceived by the collective of authors of a journal, while the ‘cited’ environment reflects the impact of journals in a local environment. In this study, we analyze citation impacts of three Chinese journals in mathematics and compare local citation impacts with impact factors. Local citation impacts reflect a journal’s status and function better than (global) impact factors. We also found that authors in Chinese journals prefer international instead of domestic ones as sources for their citations.

Keywords: Activity, Algorithm, China, Chinese, Citation, Citations, Environment, Function, Global, Impact, Impact Factors, Impacts, Index, Information, Journal, Journals, Local, Matrices, Performance, Science, Size, Sources, Technical-Papers

? Chuang, K.Y., Huang, Y.L. and Ho, Y.S. (2007), A bibliometric and citation analysis of stroke-related research in Taiwan. *Scientometrics*, **72** (2), 201-212.

Full Text: [2007\Scientometrics72, 201.pdf](2007/Scientometrics72,%20201.pdf)

Abstract: As the population ages in Taiwan, stroke research has received greater attention in recent years. Strokes have significant impacts on the health and well-being of the elderly. To formulate future research policy, information on stroke publications should be collected. In this research, we studied stroke-related research articles published by Taiwan researchers which were indexed in the Science Citation Index from 1991 to 2005. We found that the quantity of publications has increased at a quicker pace than the worldwide trend. Over the years, there has been an increase in international collaboration, mainly with researchers in the U. S. Article visibility, measured as the frequency of being cited, also increased during the period. It appears that stroke research in Taiwan has become more globally connected and has also improved in quality. The publication output was concentrated in a few institutes, but there was a wide variation among these institutes in the ability to independently conduct research. A wide array of keywords indicated a probable lack of continuity in research. Nevertheless, there was an inverse relationship between stroke mortality and number of published articles in Taiwan. To improve the quality and efficiency of stroke research, continuity in research focuses needs to be maintained, and thus funding should be allocated on a long-term basis to institutes with a proven record of success.

Keywords: Ability, Analysis, Attention, Bibliometric, Citation, Citation Analysis, Collaboration, Efficiency, Elderly, Funding, Health, Impacts, Information, International, Long Term, Long-Term, Mortality, Needs, Policy, Population, Publication, Publications, Quality, Record, Relationship, Research, Research Policy, Science, Science Citation Index, Stroke, Success, Taiwan, the Elderly, Trend, U, Visibility, Well-Being, Wellbeing

? Gordon, A. (2007), Transient and continuant authors in a research field: The case of terrorism. *Scientometrics*, **72** (2), 213-224.

Full Text: [2007\Scientometrics72, 213.pdf](2007/Scientometrics72,%20213.pdf)

Abstract: The issue of research continuance in a scientific discipline was analyzed and applied to the field of terrorism. The growing amount of literature in this field is produced mostly by one- timers who ‘visit’ the field, contribute one or two articles, and then move to another subject area. This research pattern does not contribute to the regularity and constancy of publication by which a scientific discipline is formed and theories and paradigms of the field are created. This study observed the research continuance and transience of scientific publications in terrorism by using obtainable ‘most prolific terrorism authors’ lists at different points in time. These lists designed by several terrorism researchers, presented a few researchers who contributed to the field continuously and many others whose main research interest lay in another discipline. The four lists observed included authors who were continuants, transients, new-comers, and terminators (who left the field). The lack of continuous, full-time research in a research field is typical of many disciplines, but the influence of this research pattern on a field’s growth and stability is different for older, established disciplines than for new and formative fields of study. With in the former, intellectual mobility could contribute to the rise of new topics and probably enrich the particular scientific field, with the latter, by contrast, it could hamper the formation and growth of the field.

Keywords: Formation, Growth, Mobility, Older, Publication, Publications, Research, Science, Scientific Publications, Stability, Terrorism, Time

? Pinto, M. and Doucet, A.V. (2007), An educational resource for information literacy in higher education: Functional and users analyses of the e-COMs academic portal. *Scientometrics*, **72** (2), 225-252.

Full Text: [2007\Scientometrics72, 225.pdf](2007/Scientometrics72,%20225.pdf)

Abstract: As in today’s knowledge society the Internet is playing an important role in the information literacy of university students the goal of this paper is to analyse, after its first year on the Web, the informational impact of an e-learning resource developed by Granada’s University lecturers (the e-COMS educational portal), a pioneer in Spain for training in information literacy. From the objective and subjective data provided by the own portal and by it users, two different and complementary kinds of analysis (functional and users’) are performed. Assessment of various capabilities, among which visibility and usability stand out, is provided. The highly positive but improvable results offer a detailed analysis of the functional aspects of the portal itself and of the users’ relations with this information resource. From these analyses strengths and weaknesses are extracted and some proposals for improvement are derived.

Keywords: Academic, Analysis, E-Learning, Education, Functional, Goal, Higher Education, Impact, Information, Internet, Knowledge, Links, Literacy, Paper, Role, Site, Society, Spain, Strengths, Students, Training, Universities, Usability, Visibility, World-Wide-Web

? Sidiropoulos, A., Katsaros, D. and Manolopoulos, Y. (2007), Generalized Hirsch h-index for disclosing latent facts in citation networks. *Scientometrics*, **72** (2), 253-280.

Full Text: [2007\Scientometrics72, 253.pdf](2007/Scientometrics72,%20253.pdf)

Abstract: What is the value of a scientist and its impact upon the scientific thinking? How can we measure the prestige of a journal or a conference? The evaluation of the scientific work of a scientist and the estimation of the quality of a journal or conference has long attracted significant interest, due to the benefits by obtaining an unbiased and fair criterion. Although it appears to be simple, defining a quality metric is not an easy task. To overcome the disadvantages of the present metrics used for ranking scientists and journals, J. E. Hirsch proposed a pioneering metric, the now famous h-index. In this article we demonstrate several inefficiencies of this index and develop a pair of generalizations and effective variants of it to deal with scientist ranking and publication forum ranking. The new citation indices are able to disclose trendsetters in scientific research, as well as researchers that constantly shape their field with their influential work, no matter how old they are. We exhibit the effectiveness and the benefits of the new indices to unfold the full potential of the h-index, with extensive experimental results obtained from the DBLP, a widely known on-line digital library.

Keywords: Citation, Effectiveness, Evaluation, Experimental, Global Perceptions, h Index, h-Index, Hirsch, Hirsch h-Index, Impact, Journal, Journals, Metrics, Potential, Publication, Quality, Quality of, Ranking, Research, Scholars, Scientific Research, Scientists, Value, Work

? Soler, J.M. (2007), Separating the articles of authors with the same name. *Scientometrics*, **72** (2), 281-290.

Full Text: [2007\Scientometrics72, 281.pdf](2007/Scientometrics72,%20281.pdf)

Abstract: I describe a method to separate the articles of different authors with the same name. It is based on a distance between any two publications, defined in terms of the probability that they would have as many coincidences if they were drawn at random from all published documents. Articles with a given author name are then clustered according to their distance, so that all articles in a cluster belong very likely to the same author. The method has proven very useful in generating groups of papers that are then selected manually. This simplifies considerably citation analysis when the author publication lists are not available.

Keywords: Analysis, Citation, Citation Analysis, Cluster, Groups, Nonlinear Dimensionality Reduction, Probability, Publication, Publications, Similarity

? Nadarajah, S. and Kotz, S. (2007), Models for citation behavior. *Scientometrics*, **72** (2), 291-305.

Full Text: [2007\Scientometrics72, 291.pdf](2007/Scientometrics72,%20291.pdf)

Abstract: The number of citations of journal papers is an important measure of the impact of research. Thus, the modeling of citation behavior needs attention. Burrell, Egghe, Rousseau and others pioneered this type of modeling. Several models have been proposed for the citation distribution. In this note, we derive the most comprehensive collection of formulas for the citation distribution, covering some 17 flexible families. The corresponding estimation procedures are also derived by the method of moments. We feel that this work could serve as a useful reference for the modeling of citation behavior.

Keywords: Attention, Behavior, Citation, Citations, Distribution, Estimation, Families, Flexible, Impact, Journal, Method of Moments, Modeling, Models, Obsolescence, Paper, Reference, Research

? Ouimet, M., Amara, N., Landry, R. and Lavis, J. (2007), Direct interactions medical school faculty members have with professionals and managers working in public and private sector organizations: A cross-sectional study. *Scientometrics*, **72** (2), 307-323.

Full Text: [2007\Scientometrics72, 307.pdf](2007/Scientometrics72,%20307.pdf)

Abstract: The research questions are as follows: to what extent do Canadian medical school faculty members have person-to-person interactions with individuals working in public and private sector organizations? What are the characteristics of Canadian medical school faculty members who interact with individuals working in these work settings? Are these different network patterns complementary or substitute? The data used for this study are from a cross-sectional survey of Canadian medical school faculty members (n = 907). Structural multivariate ordered probit models were estimated to explore the characteristics of faculty members with different network patterns and to see if these network patterns are complementary or substitute. Study results suggest that the different network patterns considered in the study are not conflicting, but that some patterns correspond to different faculty member profiles.

Keywords: Canada, Care, Characteristics, Evidence Based Policy, Faculty, Foundation, Interactions, Knowledge, Medical, Model, Models, Multivariate, Organizations, Profiles, Research, School, Survey

Adams, J., Gurney, K. and Marshall, S. (2007), Profiling citation impact: A new methodology. *Scientometrics*, **72** (2), 325-344.

Full Text: [2007\Scientometrics72, 325.pdf](2007/Scientometrics72,%20325.pdf)

Abstract: A methodology for creating bibliometric impact profiles is described. The advantages of such profiles as a management tool to supplement the reporting power of traditional average impact metrics are discussed. The impact profile for the UK as a whole reveals the extent to which the median and modal UK impact values differ from and are significantly below average impact. Only one-third of UK output for 1995-2004 is above world average impact although the UK’s average world-normalised impact is 1.24. Time-categorised impact profiles are used to test hypotheses about changing impact and confirm that the increase in average UK impact is due to real improvement rather than a reduction in low impact outputs. The impact profile methodology has been applied across disciplines as well as years and is shown to work well in all subject categories. It reveals substantial variations in performance between disciplines. The value of calculating the profile median and mode as well as the average impact are demonstrated. Finally, the methodology is applied to a specific data-set to compare the impact profile of the elite Laboratory of Molecular Biology (Cambridge) with the relevant UK average. This demonstrates an application of the methodology by identifying where the institute’s exceptional performance is located. The value of impact profiles lies in their role as an interpretive aid for non-specialists, not as a technical transformation of the data for scientometricians.

Keywords: Bibliometric, Citation, Impact, Low, Management, Methodology, Metrics, Nations, Output, Performance, Profile, Profiles, Reduction, Reporting, Role, Science, Test, Transformation, UK

? Pinto, M., Sales, D., Doucet, A.V., Fernandez-Ramos, A. and Guerrero, D. (2007), Metric analysis of the information visibility and diffusion about the European Higher Education Area on Spanish University websites. *Scientometrics*, **72** (2), 345-370.

Full Text: [2007\Scientometrics72, 345.pdf](2007/Scientometrics72,%20345.pdf)

Abstract: The purpose of the study proposed in this paper is to evaluate the Spanish public university websites dedicated to the European Higher Education Area (EHEA). To do so, the quality of these resources has been analysed in the light of data provided by a series of indicators grouped in seven criteria, most of which were used to determine what information is made available and in what way. The criteria used in our analysis are: visibility, authority, updatedness, accesibility, correctness and completeness, quality assessment and navigability. All in all, the results allow us to carry out an overall diagnosis of the situation and also provide us with information about the situation at each university, thus revealing their main strengths, namely authority and navegability, and also their chief shortcomings: updatedness, accessibility and quality assessment. In this way it is possible to detect the best practices in each of the aspects evaluated so that they can serve as an example and guide for universities with greater deficiencies and thus help them to improve their EHEA websites.

Keywords: Accessibility, Analysis, Assessment, Criteria, Diagnosis, Diffusion, Health Information, Indicators, Information, Light, Made, Paper, Quality, Sites, Strengths, Universities, Visibility, World-Wide-Web

? Kim, M.J. (2007), A bibliometric analysis of the effectiveness of Korea’s Biotechnology Stimulation Plans, with a comparison with four other Asian nations. *Scientometrics*, **72** (3), 371-388.

Full Text: [2007\Scientometrics72, 371.pdf](2007/Scientometrics72,%20371.pdf)

Abstract: This study investigates the scientific output and publication patterns of Korean biotechnology before and after the start of the Korean Biotechnology Stimulation Plans (1994-2007), and then compares the results with publication data from the same time periods for Japan, the People’s Republic of China, Taiwan and Singapore. For this study, 14,704 publications, published by at least one researcher from one of the five Asian nations (indexed by SCI Expanded during the years 1990-1993 and the years 2000-2003), were considered. A marked increase of Korean research output in biotechnology was largely influenced by an increasing tendency for researchers to enter the field of biotechnology and by increased expenditures for R&D activity through the Korean Biotechnology Stimulation Plans. In addition, the SCI Expanded coverage of national journals affected the scientific output and publication patterns of Japanese and Korean researchers. Looking at the Korean publications by collaboration type, international collaboration leads to more publications in mainstream journals of high impact factors than local and domestic collaborations for the two periods. However, although the Korean Biotechnology Stimulation Plans were followed by a remarkable increase in South Korea’s research output, this increase has not been accompanied by growth in the quality of those publications in terms of impact factors of journals for Korean publications.

Keywords: Activity, Analysis, Asian, Bibliometric, Bibliometric Analysis, Biotechnology, China, Collaboration, Comparison, Effectiveness, Expenditures, Growth, Impact, Impact Factors, Indicators, International Collaboration, Japan, Journals, Local, Output, Patent Statistics, Publication, Publications, Quality, Research, SCI, Scientific Output, Singapore, Taiwan, Time

? Hu, X.J. (2007), Relative Superiority Coefficient of papers: A new dimension for institutional research performance in different fields. *Scientometrics*, **72** (3), 389-402.

Full Text: [2007\Scientometrics72, 389.pdf](2007/Scientometrics72,%20389.pdf)

Abstract: Cross-field comparison of citation measures of scientific achievement or research quality is severely hindered by the diversity of the stage of development and citation habits of different disciplines or fields. Based on the same principles of RCR (Relative Citation Rate) and RW (Relative Subfield Citedness), a new dimension - the Relative Superiority Coefficient (SC (n)) in research quality was introduced. This can indicate clearly the relative research level for research groups at multiple levels in the respective field by consistent criteria in terms of research quality. Comparison of the SC (n) within or across 22 broad fields among 5 countries were presented as an application model. Hierarchical Cluster and One-Way ANOVA were applied and processed by the statistical program SPSS. All original data were from Essential Science Indicators (ESI) 1996-2006.

Keywords: Achievement, Anova, Citation, Comparison, Development, Diversity, Groups, Indicators, Journal Impact Factor, Levels, Model, Performance, Program, Quality, Research, Research Performance, Research Quality, Science-Citation-Index, UK

? Guan, J.C. and He, Y. (2007), Patent-bibliometric analysis on the Chinese science - technology linkages. *Scientometrics*, **72** (3), 403-425.

Full Text: [2007\Scientometrics72, 403.pdf](2007/Scientometrics72,%20403.pdf)

Abstract: The purpose of this study is to explore the character and pattern of the linkage between science and technology in China, based on the database of United States Patent and Trademark Office (USPTO). The analysis is focused on the period 1995-2004, a rapid increasing period for Chinese US patents. Using the scientific non-patent references (NPRs) within patents, we investigate the science-technology connection in the context of Chinese regions as well as industrial sectors classified by International Patent Classification (IPC). 11 technological domains have been selected to describe the science intensity of the technology. The results suggest that the patents and the corresponding scientific citations are related in different ways. Finally, we match the scientific NPRs to the Science Citation Index (SCI) covered publications to identify the core journals and categories. It reveals that the scientific references covered by SCI show a skewed distribution not only in journals but also in categories.

Keywords: Analysis, Basic Research Literature, Biotechnology Sectors, China, Chinese, Citations, Core, Database, Distribution, Domains, Germany, Indicators, Industrial, Industry, Innovation Systems, Intensity, Journals, Knowledge Flows, Patents, Publications, SCI, Science, Science and Technology, Science Citation Index, Statistics, United States, US

? Fowler, J.H. and Aksnes, D.W. (2007), Does self-citation pay? *Scientometrics*, **72** (3), 427-437.

Full Text: [2007\Scientometrics72, 427.pdf](2007/Scientometrics72,%20427.pdf)

Abstract: Self-citations - those where authors cite their own works - account for a significant portion of all citations. These self-references may result from the cumulative nature of individual research, the need for personal gratification, or the value of self-citation as a rhetorical and tactical tool in the struggle for visibility and scientific authority. In this article we examine the incentives that underlie self-citation by studying how authors’ references to their own works affect the citations they receive from others. We report the results of a macro study of more than half a million citations to articles by Norwegian scientists that appeared in the Science Citation Index. We show that the more one cites oneself the more one is cited by other scholars. Controlling for numerous sources of variation in cumulative citations from others, our models suggest that each additional self-citation increases the number of citations from others by about one after one year, and by about three after five years. Moreover, there is no significant penalty for the most frequent self-citers - the effect of self-citation remains positive even for very high rates of self-citation. These results carry important policy implications for the use of citations to evaluate performance and distribute resources in science and they represent new information on the role and impact of self-citations in scientific communication.

Keywords: Affect, Citations, Communication, Impact, Incentives, Indicators, Information, Models, Performance, Policy, Policy Implications, Research, Role, Science, Science Citation Index, Scientific Communication, Sources, Visibility

? Lewison, G. (2007), The reporting of the risks from genetically modified organisms in the mass media, 2002-2004. *Scientometrics*, **72** (3), 439-458.

Full Text: [2007\Scientometrics72, 439.pdf](2007/Scientometrics72,%20439.pdf)

Abstract: This paper describes an analysis of coverage of the risks from agricultural and food genetically-modified organisms (GMOs) from April 2002 to April 2004 in 14 news media from six countries (Canada, France, Germany, Spain, the UK and the USA) which was conducted as part of a review for the European Commission of the management of risk communication. A total of 597 relevant news articles were found and coded for their presentational tone, the types of risk (environmental, financial, health and political, in that order), the organisms described (mainly maize, rape and beet crops), and the documents, people and organisations cited. UK news media tended to be the most ‘scary’ and Spanish ones the most ‘robust’. Articles quoting public perceptions, non-governmental environmental organisations and politicians tended to emphasize the risks of GMOs, those quoting scientists tended to downplay the risks and describe their potential benefits. Some suggestions for possible action by the European Commission are put forward, such as the facilitation of contact between journalists and scientists, but it is recognized that for some newspapers, their editorial wish to campaign will inevitably over-ride their reporters’ wish to present the truth.

Keywords: Agricultural, Analysis, Biotechnology, Canada, Communication, Corn Pollen, Coverage, Environmental, European Commission, Food, France, Germany, Health, Maize, Management, Mass Media, Media, Modified, Modified Foods, News, Opinion, Order, Organisms, Paper, Perceptions, Reporting, Review, Risk, Risk Communication, Risks, Spain, UK, US, USA

? Buehring, G.C., Buehring, J.E. and Gerardc, P.D. (2007), Lost in citation: Vanishing visibility of senior authors. *Scientometrics*, **72** (3), 459-468.

Full Text: [2007\Scientometrics72, 459.pdf](2007/Scientometrics72,%20459.pdf)

Abstract: The senior author is usually last on the byline of scientific publications, yet generally has made the second most important contribution. The explosion in author number per scientific paper, has necessitated limits on the number of authors allowed in cited references, frequently resulting in senior author truncation. Would potential visibility gained from citations in top-tier journals be offset by senior author omission? We found evidence for this in a sample of 208 journals, showing significant associations between author limits in cited references and various measures of journal quality. These associations, however, differed among biological science, physical science, and interdisciplinary journals.

Keywords: Citation, Citations, Interdisciplinary, Journal, Journals, Made, Order, Paper, Patterns, Physical, Publications, Quality, Science, Scientific Publications, Visibility

? Hellsten, I., Lambiotte, R., Scharnhorst, A. and Ausloos, M. (2007), Self-citations, co-authorships and keywords: A new approach to scientists’ field mobility? *Scientometrics*, **72** (3), 469-486.

Full Text: [2007\Scientometrics72, 469.pdf](2007/Scientometrics72,%20469.pdf)

Abstract: This paper introduces a new approach to detecting scientists’ field mobility by focusing on an author’s self-citation network, and the co-authorships and keywords in self-citing articles. Contrary to much previous literature on self-citations, we will show that author’s self-citation patterns reveal important information on the development and emergence of new research topics over time. More specifically, we will discuss self-citations as a means to detect scientists’ field mobility. We introduce a network based definition of field mobility, using the Optimal Percolation Method (Lambiotte & Ausloos, 2005, 2006). The results of the study can be extended to selfcitation networks of groups of authors and, generally also for other types of networks.

Keywords: Academic Disciplines, Communication, Cumulative Advantages, Development, Emergence, Evolution, Groups, Information, Literatures, Mobility, Networks, Paper, Patterns, Physicists, Research, Science, Specialties, Time

? Prpic, K. (2007), Changes of scientific knowledge production and research productivity in a transitional society. *Scientometrics*, **72** (3), 487-511.

Full Text: [2007\Scientometrics72, 487.pdf](2007/Scientometrics72,%20487.pdf)

Abstract: The main objective of this paper is to provide an empirical insight into the changes in the basic characteristics of the knowledge production mode and of scientific productivity in the Croatian research system in the transitional period. Empirical analysis is based on the results of two comparable questionnaire studies. The first survey was conducted in 1990 and the sample covered 921 respondents, while the second survey was conducted in 2004 with a sample of 915 respondents. The central characteristics of the knowledge production mode and of productivity confirm an expected duality: the features that accompany the introduction of a competitive system of research funding and evaluation on the one hand, and the anachronistic and newly acquired peculiarity of the research system on the other. Thus, the gap between the improved scientific performance of the researchers and the conditions in which they work has deepened. Scientific productivity still lags behind the productivity of the (developed) countries. Though Croatian researchers publish less, they follow basic global trends in the structure of publications, especially the rise in foreign and co-authored works.

Keywords: Academy, Analysis, Characteristics, Croatia, Determinants, Duality, Eastern-Europe, Evaluation, Faculty, Features, Funding, Global, Hand, Knowledge, Paper, Performance, Production, Productivity, Publication Productivity, Publications, Questionnaire, Research, Research Funding, Research Productivity, Research Systems, Russia, Science, Scientific Productivity, Society, Structure, Survey, Transformation, Trends

? Kostoff, R.N. (2007), The difference between highly and poorly cited medical articles in the journal Lancet. *Scientometrics*, **72** (3), 513-520.

Full Text: [2007\Scientometrics72, 513.pdf](2007/Scientometrics72,%20513.pdf)

Abstract: Characteristics of highly and poorly cited research articles (with Abstracts) published in The Lancet over a three-year period were examined. These characteristics included numerical (numbers of authors, references, citations, Abstract words, journal pages), organizational (first author country, institution type, institution name), and medical (medical condition, study approach, study type, sample size, study outcome). Compared to the least cited articles, the most cited have three to five times the median number of authors per article, fifty to six hundred percent greater median number of references per article, 110 to 490 times the median number of citations per article, 2.5 to almost seven times the median number of Abstract words per article, and 2.5 to 3.5 times the median number of pages per article. The most cited articles’ medical themes emphasize breast cancer, diabetes, coronary circulation, and HIV immune system problems, focusing on large-scale clinical trials of drugs. The least cited articles’ themes essentially do not address the above medical issues, especially from a clinical trials perspective, cover a much broader range of topics, and have much more emphasis on social and reproductive health issues. Finally, for sample sizes of clinical trials specifically, those of the most cited articles ranged from a median of about 1500 to 2500, whereas those of the least cited articles ranged from 30 to 40.

Keywords: Breast Cancer, Cancer, Characteristics, Citation, Citations, Clinical, Clinical Trials, Clinical-Research, Condition, Diabetes, Drugs, Health, HIV, Impact, Institution, Journal, Medical, Numerical, Organizational, Outcome, Publication Bias, Quality, Range, Reproductive, Research, Research Articles, Size, Social

? Chiu, W.T. and Ho, Y.S. (2007), Bibliometric analysis of tsunami research. *Scientometrics*, **73** (1), 3-17.

Full Text: [2007\Scientometrics73, 3.pdf](2007/Scientometrics73,%203.pdf), [2007\Scientometrics73, 3-O.pdf](2007/Scientometrics73,%203-O.pdf)

Abstract: The use of the bibilometric analytical technique for examining tsunami research does not exist in the literature. The objective of the study was to perform a bibliometric analysis of all tsunami-related publications in the Science Citation Index (SCI). Analyzed parameters included document type, language of publication, publication output, authorship, publication patterns, distribution of subject category, distribution of author keywords, country of publication, most-frequently cited article, and document distribution after the Indonesia tsunami. The US and Japan produced 53% of the total output where the seven major industrial countries accounted for the majority of the total production. English was the dominant language, comprising 95% of articles. A simulation model was applied to describe the relationship between the number of authors and the number of articles, the number of journals and the number of articles, and the percentage of total articles and the number of times a certain keyword was used. Moreover the tsunami publication patterns in the first 8 months after the Indonesia tsunami occurred on 26 December 2004 indicated a high percentage of non-article publications and more documents being published in journals with higher impact factors.

Keywords: Analysis, Authors, Authorship, Bibliometric, Bibliometric Analysis, Citation, Country, Distribution, Factors, First, Impact, Impact Factors, Indonesia, Japan, Journals, Language, Literature, Majority, Model, Objective, Production, Publication, Publications, Relationship, Research, SCI, Science, Science Citation Index, Simulation, Simulation Model, Technique, US

? Burrell, Q.L. (2007), Hirsch index or Hirsch rate? Some thoughts arising from Liang’s data. *Scientometrics*, **73** (1), 19-28.

Full Text: [2007\Scientometrics73, 19.pdf](2007/Scientometrics73,%2019.pdf)

Abstract: Hirsch’s h- index gives a single number that in some sense summarizes an author’s research output and its impact. Since an individual author’s h-index will be time-dependent, we propose instead the h- rate which, according to theory, is (almost) constant. We re-analyse a previously published data set (LIANG, 2006) which, although not of the precise form to properly test our model, reveals that in many cases we do not have a constant h- rate. On the other hand this then suggests ways in which deeper scientometric investigations could be carried out. This work should be viewed as complementary to that of LIANG (2006).

Keywords: Complementary, h Index, h-Index, Hirsch, Hirsch Index, Impact, Investigations, Model, Research, Scientometric, Theory, Time-Dependent, Work

? Daizadeh, I. (2007), Issued US patents, patent-related global academic and media publications, and the US market indices are inter-correlated, with varying growth patterns. *Scientometrics*, **73** (1), 29-36.

Full Text: [2007\Scientometrics73, 29.pdf](2007/Scientometrics73,%2029.pdf)

Abstract: The increase in patents is a main driving force for discussions of international competitiveness, knowledge spillovers, patent office efficiencies, and others. However, to the author’s knowledge, it is interesting that no work has investigated the impact of the growth in the number of patents on patent-related scholarly (peer-reviewed) and media (e.g., press release) literatures, or evidence of inter-relatedness among these three literatures with those of the US market indices (viz., Dow, S&P500, NASDAQ). Here, I report that the growth in the number of US issued patents, the patent-related media and peer-reviewed publications, and these indices are statistically correlated, but with drastically different growth rates. This general result affords data supporting a hypothesis that publicly traded companies, as drivers of innovation, are priming a new research area within the scholarly communities and simultaneously affecting market value through, what-may-be-called, ‘patent journalism.’.

Keywords: Academic, Biotechnology, Communities, Driving, General, Global, Growth, Growth Rates, Impact, Indicators, Innovation, Knowledge, Media, Patents, Publications, Release, Research, Statistics, US, Value

? Pereira, J.C.R., Vasconcellos, J.P., Furusawa, L. and Barbati, A.D. (2007), Who’s who and what’s what in Brazilian Public Health Sciences. *Scientometrics*, **73** (1), 37-52.

Full Text: [2007\Scientometrics73, 37.pdf](2007/Scientometrics73,%2037.pdf)

Abstract: Introduction: The present study endeavours to provide information on what are the research interests of Brazilian Public Health and how authors can be ranked. Methods: Post-graduate faculty members ISI data are analysed according to regions. Number of paper and its citations, papers’ type-complexity-cooperation, Bradford’s Law, Shannon’s indexes, time dynamic functions, Lotka’s Law, and ranking functions are examined. Results: Current production was built up in the last 30 years at a rate of 9.6% articles/year and 12.6% citations/year. 66% of potential authors were present in ISI data records, 64% achieved at least one citation. Research fields do not much depart from the traditional PH purview. More than 66% of authors have just one paper and decrease is steep. Subtle differences call attention to the South region. Conclusion: Brazilian PH is mainly committed to classical research fields and ranking among authors is narrow.

Keywords: Attention, Citation, Citations, Communication, Dynamic, Faculty, Information, ISI, Mathematical-Theory, Paper, pH, Potential, Production, Ranking, Rate, Research, Time

? De Moya-Anegon, F., Chinchilla-Rodriguez, Z., Vargas-Quesada, B., Corera-Alvarez, E., Munoz-Fernandez, F.J., Gonzalez-Molina, A. and Herrero-Solana, V. (2007), Coverage analysis of Scopus: A journal metric approach. *Scientometrics*, **73** (1), 53-78.

Full Text: [2007\Scientometrics73, 53.pdf](2007/Scientometrics73,%2053.pdf)

Abstract: Our aim is to compare the coverage of the Scopus database with that of Ulrich, to determine just how homogenous it is in the academic world. The variables taken into account were subject distribution, geographical distribution, distribution by publishers and the language of publication. The analysis of the coverage of a product of this nature should be done in relation to an accepted model, the optimal choice being Ulrich’s Directory, considered the international point of reference for the most comprehensive information on journals published throughout the world. The results described here allow us to draw a profile of Scopus in terms of its coverage by areas - geographic and thematic - and the significance of peer-review in its publications. Both these aspects are highly pragmatic considerations for information retrieval, the evaluation of research, and the design of policies for the use of scientific databases in scientific promotion.

Keywords: Academic, Analysis, Database, Databases, Design, Distribution, Evaluation, Information, Information Retrieval, Journal, Journals, Language, Model, Peer Review, Peer-Review, Profile, Promotion, Publication, Publications, Reference, Research

? Krauss, J. (2007), Journal self-citation rates in ecological sciences. *Scientometrics*, **73** (1), 79-89.

Full Text: [2007\Scientometrics73, 79.pdf](2007/Scientometrics73,%2079.pdf)

Abstract: Impact factors are a widely accepted means for the assessment of journal quality. However, journal editors have possibilities to influence the impact factor of their journals, for example, by requesting authors to cite additional papers published recently in that journal thus increasing the self-citation rate. I calculated self-citation rates of journals ranked in the Journal Citation Reports of ISI in the subject category ‘Ecology’ (n = 107). On average, self citation was responsible for 16.2±1.3% (mean±SE) of the impact factor in 2004. The self-citation rates decrease with increasing journal impact, but even high impact journals show large variation. Six journals suspected to request for additional citations showed high self-citation rates, which increased over the last seven years. To avoid further deliberate increases in self-citation rates, I suggest to take journal-specific self-citation rates into account for journal rankings.

Keywords: Assessment, Citation, Citations, Editors, Impact, Impact Factor, ISI, Journal, Journal Citation Reports, Journals, Quality, Rankings, Rate, Sciences, Scientific Journals

? Csajbok, E., Berhidi, A., Vasas, L. and Schubert, A. (2007), Hirsch-index for countries based on essential science indicators data. *Scientometrics*, **73** (1), 91-117.

Full Text: [2007\Scientometrics73, 91.pdf](2007/Scientometrics73,%2091.pdf)

Abstract: The authors present ranked lists of world’s countries - with main focus on EU countries (together with newly acceeded and candidate countries) - by their h-index on various science fields. As main source of data Thomson Scientific’s Essential Science Indicators (ESI) database was used. EU countries have strong positions in each field but none of them can successfully compete with the USA. The modest position of the newly accessed and candidate countries illustrate the importance of supportive economic and political background in order to achieve scientific success. An attempt is made to fit a recent theoretical model relating the h-index with two traditional scientometric indicators: the number of publications and the mean citation rate.

Keywords: Citation, Database, EU, h Index, h-Index, Hirsch Index, Indicators, Model, Publications, Science, Science Indicators, Scientometric, USA

? Jacob, J.H., Lehrl, S. and Henkel, A.W. (2007), Early recognition of high quality researchers of the German psychiatry by worldwide accessible bibliometric indicators. *Scientometrics*, **73** (2), 117-130.

Full Text: [2007\Scientometrics73, 117.pdf](2007/Scientometrics73,%20117.pdf)

Abstract: Background: Publication and citation rates mark the research activity and research quality of scientists. Question: Are bibliometric indicators valid instruments for early recognition of high quality researchers? Subjects and methods: The number of publications and citations of 26 assistant, associate and full professors of German psychiatry born after 1947 was analysed in their 30(th) and 31(st) year of age and between 1996 and 2000. Results: 58% of the selected 30 or 31 year old scientists had at least one publication in a journal with an impact factor, 93% of these as first or single author. 42% in this age group were at least cited once. Publication and citation rates in the early stage of a career provide hints on the later bibliometric data and the academic degree of scientists. Conclusion: High quality researchers can be recognised early in their careers by means of worldwide accessible bibliometric indicators.

Keywords: Academic, Activity, Age, Bibliometric, Bibliometric Indicators, Citation, Citation Indexes, Citations, Group, Impact, Impact Factor, Indicators, Journal, Methods, Psychiatry, Publication, Publications, Quality, Recognition, Research, Research Quality, Scientific Performance

? Diamond, Jr., A.M. and Toth, R.J. (2007), The determinants of election to the Presidency of the American Economic Association: Evidence from a cohort of distinguished 1950’s economists. *Scientometrics*, **73** (2), 131-137.

Full Text: [2007\Scientometrics73, 131.pdf](2007/Scientometrics73,%20131.pdf)

Abstract: Data have been collected on 55 members of the AEA Executive Committees for the years 1950-1960 (inclusive) on a variety of variables that measure the merit and non-merit characteristics of the economists. A logit is estimated in which the dependent variable is a dummy variable for whether an Executive Committee member was ever elected President of the American Economic Association (AEA). The number of publications and citations are important determinants of election. Receiving a PhD from one of the top three schools does not help and living in the South does not hurt. Economists who were older in 1956 were more likely to have eventually been elected to the AEA Presidency.

Keywords: Characteristics, Citations, Cohort, Older, Publications, Schools, Science

? Bornmann, L., Mutz, R. and Daniel, H.D. (2007), Row-column (RC) association model applied to grant peer review. *Scientometrics*, **73** (2), 139-147.

Full Text: [2007\Scientometrics73, 139.pdf](2007/Scientometrics73,%20139.pdf)

Abstract: In a recently published article, HARGENS & FIERTING (2006) apply the row-column (RC) association model to peer review to analyze the association between two referees’ recommendations and an editor’s decision at two scholarly journals. In the present study we analyze 1,954 applications to the Boehringer Ingelheim Fonds (B.I.F.) for doctoral and post-doctoral fellowships, which the B.I.F. evaluates in three stages (first stage: evaluation by an external reviewer, second stage: evaluation by an internal reviewer (staff member), third stage: final decision by the B.I.F. Board of Trustees). Using the RC association model, we show - in accordance with the results of HARGENS & HERTING (2006) - that a single latent dimension is sufficient to account for the association between (internal and external) reviewers’ recommendations and the fellowship award decision by the Board. This result indicates that the latent dimension underlying reviewers’ recommendations and the Board’s decisions reflects the merit of an application being evaluated. While the statistical analyses establish that overall, favorable evaluations by the reviewers correspond with favorable decisions by the Board (and vice versa), the ordering of the scale values yielded by the estimation of the RC association model also shows that internal reviewers’ recommendations have a greater influence on the Board’s decisions than recommendations by external reviewers.

Keywords: Application, Applications, Assessments, Committee, Decisions, Estimation, Evaluation, Fellowship, Internal, Journals, Model, Peer Review, Peer-Review, Recommendations, Reliability, Review, Scale, Selection, Vice

? Senthilkumaran, P. and Amudhavalli, A. (2007), Mapping of spices research in Asian countries. *Scientometrics*, **73** (2), 149-159.

Full Text: [2007\Scientometrics73, 149.pdf](2007/Scientometrics73,%20149.pdf)

Abstract: This paper intends to observe the Asian R&D output on ‘Spices’ for the co-relation between the Asian Countries and that of the sub-fields of Spices Research and the dynamic changes, if any, in their research priorities. The chosen study period is two decades: 1983-2002. Hort CD is the source database for this research. On these premises, the frequency of keywords found in the Descriptor Field of each record in the chosen database. Mapping technique is adopted for analysis using Data and Text Mining (DTM) software. This enabled to correlate the countries versus the subject priority amongst the Asian Countries during the study period. The inferences drawn are reported along with the interpretations.

Keywords: Analysis, Areas, Asian, CD, Database, Dynamic, Indicators, Output, Paper, Research, Science, Software, Source

? Burrell, Q.L. (2007), Time-dependent aspects of co-concentration in informetrics. *Scientometrics*, **73** (2), 161-174.

Full Text: [2007\Scientometrics73, 161.pdf](2007/Scientometrics73,%20161.pdf)

Abstract: It is a well-known empirical fact that when informetric processes are observed over an extending period of time, the entire shape of the distribution changes. In particular, it has been shown that concentration aspects change. In this paper the recently introduced co-concentration coefficient (C-CC) is investigated via simple stochastic models of informetric processes to investigate its time-dependence. It is shown that it is important to distinguish between situations where the zero-producers can be counted and those where they cannot. A previously published data set is used to illustrate how the empirical C-CC develops in time and the general features are compared with those derived from the theoretical model.

Keywords: Behavior, Citation Distribution, Concentration, Distribution, Distributions, Empirical, Features, General, Gini Index, Informetrics, Model, Models, Paper, Shape, Stochastic, Stochastic-Model, Theoretical Model, Time

? Gauffriau, M., Larsen, P.O., Maye, I., Roulin-Perriard, A. and von Ins, M. (2007), Publication, cooperation and productivity measures in scientific research. *Scientometrics*, **73** (2), 175-214.

Full Text: [2007\Scientometrics73, 175.pdf](2007/Scientometrics73,%20175.pdf)

Abstract: The literature on publication counting demonstrates the use of various terminologies and methods. In many scientific publications, no information at all is given about the counting methods used. There is a lack of knowledge and agreement about the sort of information provided by the various methods, about the theoretical and technical limitations for the different methods and about the size of the differences obtained by using various methods. The need for precise definitions and terminology has been expressed repeatedly but with no success. Counting methods for publications are defined and analysed with the use of set and measure theory. The analysis depends on definitions of basic units for analysis (three chosen for examination), objects of study (three chosen for examination) and score functions (five chosen for examination). The score functions define five classes of counting methods. However, in a number of cases different combinations of basic units of analysis, objects of study and score functions give identical results. Therefore, the result is the characterization of 19 counting methods, five complete counting methods, five complete-normalized counting methods, two whole counting methods, two whole-normalized counting methods, and five straight counting methods. When scores for objects of study are added, the value obtained can be identical with or higher than the score for the union of the objects of study. Therefore, some classes of counting methods, including the classes of complete, complete-normalized and straight counting methods, are additive, others, including the classes of whole and whole-normalized counting methods, are non-additive. An analysis of the differences between scores obtained by different score functions and therefore the differences obtained by different counting methods is presented. In this analysis we introduce a new kind of objects of study, the class of cumulative-turnout networks for objects of study, containing full information on cooperation. Cumulative-turnout networks are all authors, institutions or countries contributing to the publications of an author, an institute or a country. The analysis leads to an interpretation of the results of score functions and to the definition of new indicators for scientific cooperation. We also define a number of other networks, internal cumulative-turnout networks, external cumulative-turnout networks, underlying networks, internal underlying networks and external underlying networks. The networks open new opportunities for quantitative studies of scientific cooperation.

Keywords: Additive, Analysis, Authored Papers, Characterization, Citation, Co-Authorship, Countries, Examination, Formula, Indicators, Information, Institutions, Internal, Knowledge, Limitations, Methods, Networks, Productivity, Publication, Publications, Research, Science, Scientific Publications, Size, Standards, Terminology, Theory, Value

? Munteanu, R. and Apetroae, M. (2007), Journal relatedness: An actor-actor and actor-objectives case study. *Scientometrics*, **73** (2), 215-230.

Full Text: [2007\Scientometrics73, 215.pdf](2007/Scientometrics73,%20215.pdf)

Abstract: Using the MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations) method, a set of 13 related journals covering the subject category ‘Chemistry, Multi disciplinary’ was analyzed in terms of direct and indirect reciprocal influences (measured by relatedness indexes Rji), their positions towards a generic set of common objectives (total cites, impact factor, immediacy index, number of published articles, cited half life) and the convergences (Actors x Actors and Actors x Objectives) existing in the above-mentioned relatedness network. The study identified 4 types of actors: dominant (3), independent (8), relay (1) and dominated (1)- Maps of: influences and dependences between actors, convergence between actors, net distances between actors and actors-objectives relationships are presented, together with short interpretations. Defining scientific journals as actors on a specific ‘knowledge market’, identifying influences and dependences between them and positioning these journals towards a set of measurable objectives creates an interesting possibility to define ‘relationships of power’ of a strategic nature and enables the introduction of more complex future-oriented scientometric analyses than those based solely on standard bibliometric indicators such as the impact factor.

Keywords: Bibliometric, Bibliometric Indicators, Case Study, Complex, Direct, Half-Life, Immediacy Index, Impact, Impact Factor, Index, Indicators, Journals, Life, Method, Network, Scientific Journals, Standard

? Robert, C., Wilson, C.S., Gaudy, J.F. and Arreto, C.D. (2007), The evolution of the sleep science literature over 30 years: A bibliometric analysis. *Scientometrics*, **73** (2), 231-256.

Full Text: [2007\Scientometrics73, 231.pdf](2007/Scientometrics73,%20231.pdf)

Abstract: During the 1974-2004 period, the sleep literature had quadrupled (2384 publications in 1974, and 9721 in 2004) while overall scientific productivity had only doubled. The set of the seven most productive countries (USA, Japan, United Kingdom, Germany, France, Canada and Italy) in sleep research, and the geographical region distribution remained stable over the three decades. On the other hand several indicators appeared in the sleep research literature during the 1990s: the increasing productivity of sleep researchers, the growing number of countries publishing on sleep, the continuous creation of sleep-focused journals, the scattering of sleep publication among increasingly more scientific journals, the turnover among the leading journals, and the emergence of new entities such as China, Turkey, and the European Union.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Canada, China, Creation, Distribution, Emergence, European Union, Evolution, France, Germany, Hand, History, Indicators, Italy, Japan, Journals, Output, Productivity, Publication, Publications, Publishing, Research, Scattering, Science, Scientific Journals, Scientific Productivity, Sleep, Trends, Turkey, Turnover, United Kingdom, USA

? Minasny, B., Hartemink, A.E. and McBratney, A. (2007), Soil science and the h index. *Scientometrics*, **73** (3), 257-264.

Full Text: [2007\Scientometrics73, 257.pdf](2007/Scientometrics73,%20257.pdf)

Abstract: Soil science is a relatively young and specialised field of science. This note discusses the use of the h index as a scientific output measure in soil science. We explore the governing factors of h index in soil science: the number of soil scientists, the number of papers published, the average number of citations, and the age of the scientist. We found the average relationship between h index and scientific age for soil science: h = 0.7 t. The h index for soil science is smaller than other major science disciplines but norms for h need to be established.

? Zhou, F., Guo, H.C., Ho, Y.S. and Wu, C.Z. (2007), Scientometric analysis of geostatistics using multivariate methods. *Scientometrics*, **73** (3), 265-279.

Full Text: [2007\Scientometrics73, 265.pdf](2007/Scientometrics73,%20265.pdf)

Abstract: Multivariate methods were successfully employed in a comprehensive scientometric analysis of geostatistics research, and the publications data for this research came from the Science Citation Index and spanned the period from 1967 to 2005. Hierarchical cluster analysis (CA) was used in publication patterns based on different types of variables. A backward discriminant analysis (DA) with appropriate statistical tests was then conducted to confirm CA results and evaluate the variations of various patterns. For authorship pattern, the 50 most productive authors were classified by CA into 4 groups representing different levels, and DA produced 92.0% correct assignment with high reliability. The discriminant parameters were mean impact factor (MIF), annual citations per publication (ACPP), and the number of publications by the first author, for country/region pattern, CA divided the top 50 most productive countries/regions into 4 groups with 95.9% correct assignments, and the discriminant parameters were MIF, ACCP, and independent publication (IP), for institute pattern, 3 groups were identified from the top 50 most productive institutes with nearly 88.0% correct assignment, and the discriminant parameters were MIF, ACCP, IP, and international collaborative publication, last, for journal pattern, the top 50 most productive journals were classified into 3 groups with nearly 98.0% correct assignment, and its discriminant parameters were total citations, impact factor and ACCP. Moreover, we also analyzed general patterns for publication document type, language, subject category, and publication growth.

Keywords: Bibliometric Analysis, Parameters, Patterns, Uncertainty

Abt, H.A. (2007), The publication rate of scientific papers depends only on the number of scientists. *Scientometrics*, **73** (3), 281-288.

Full Text: [2007\Scientometrics73, 281.pdf](2007/Scientometrics73,%20281.pdf)

Abstract: In the fields of physics, astronomy, geophysics, mathematics, and chemistry, the numbers of American papers published depend only on the membership numbers of their scientific societies and not upon improved facilities or instrumental breakthroughs, although those improvements have caused the scientific contents of those papers to be far better in recent decades. In the past 30-35 years there have been no increases in the average annual number of published papers per scientist in those fields.

Andrés, A., Gómez, J. and Saldaña, C. (2007), The transtheoretical model and obesity: A bibliometric study. *Scientometrics*, **73** (3), 289-301.

Full Text: [2007\Scientometrics73, 289.pdf](2007/Scientometrics73,%20289.pdf)

Abstract: The Transtheoretical Model of behaviour change is currently one of the most promising models in terms of understanding and promoting behaviour change related to the acquisition of healthy living habits. By means of a bibliographic search of papers adopting a TTM approach to obesity, the present bibliometric study enables the scientific output in this field to be evaluated. The results obtained reveal a growing interest in applying this model to both the treatment of obesity and its prevention. Otherwise, author and journal outputs fit the models proposed by Lotka and Bradford, respectively.

Keywords: Behavior, Cessation, Decisional Balance, Exercise, Health, Physical-Activity, Predictors, Primary-Care, Self-Change, Smoking

? Iglesias, J.E. and Pecharroman, C. (2007), Scaling the h-index for different scientific ISI fields. *Scientometrics*, **73** (3), 303-320.

Full Text: [2007\Scientometrics73, 303.pdf](2007/Scientometrics73,%20303.pdf)

Abstract: We propose a simple way to put in a common scale the h values of researchers working in different scientific ISI fields, so that the foreseeable misuse of this index for inter-areas F comparison might be prevented, or at least, alleviated.

Keywords: Comparison, h Index, h-Index, Hirsch-Index, Impact, ISI, Ranking

? Yu, G. and Wang, L. (2007), The self-cited rate of scientific journals and the manipulation of their impact factors. *Scientometrics*, **73** (3), 321-330.

Full Text: [2007\Scientometrics73, 321.pdf](2007/Scientometrics73,%20321.pdf)

Abstract: Owing to some discussions about manipulating impact factor by requesting authors to increase their citations to the publication journal, we theoretically establish a mathematical expression of a relation between the journal self-citation rate and its impact factor by the single-factor method in this paper. Based on self-citation data of some journals in JCR and the observed relation between journal impact factor and the self-cited rate, we analyze the possibility that journal editors manipulate impact factors of their journals by raising the self-cited rate. Finally, we make some suggestions for supervising this crude way of active manipulating the impact factor.

Keywords: Citations, Editors, Publication Delays

? Wang, S.H., Wang, H.J. and Weldon, P.R. (2007), Bibliometric analysis of English-language academic journals of China and their internationalization. *Scientometrics*, **73** (3), 331-343.

Full Text: [2007\Scientometrics73, 331.pdf](2007/Scientometrics73,%20331.pdf)

Abstract: The internationalization of ten of China’s English-language scientific journals is analyzed based on their Impact Factor, Total Citation, JCR list rank, international paper proportion and international citation proportion. Six of these journals were financed three times by the National Natural Science Foundation of China (NNSF) between 2001-2006 and four journals maintained a higher impact factor (> 1.0) in 2003-2005. The data show that though the total trend of Impact Factor and Total Citation keeps rising, their subject rank has shown a slight decrease. Moreover, the proportion of international papers and international citations do not match their JCR rank and IF: high rank journals have a low proportion of international papers (Chinese Phys Lett, Chinese Phys) and low rank journals have a high Impact Factor (Cell Res, Asian J Androl). This inconsistency may result from their insufficient internationalization either in international paper proportion (less than 20%) or in the amount of high-quality manuscripts, probably caused by their local journal title, circulation and low IF. Suggested means of improving internationalization include encouraging Chinese scientists to cite more home journals when they publish their papers in foreign journals, soliciting the submission of international co-authorships based on the unavailability of pure foreign authorship, cooperating with internationally recognized publishers to utilize their globalization platform, employing overseas scientists to recruit international papers, improving writing style and content, to enable greater accessibility to worldwide readers.

Keywords: Impact, Scientific Journals

? Braun, T. and Schubert, A. (2007), The growth of research on inter- and multidisciplinarity in science and social science papers, 1975-2006. *Scientometrics*, **73** (3), 345-351.

Full Text: [2007\Scientometrics73, 345.pdf](2007/Scientometrics73,%20345.pdf)

Abstract: In a follow-up study of a previous analysis concerning the period 1980-1999, we found that inter-/multidisciplinary remained a highlighted title term both in science and social science papers. It is suggested that science policy should give proper priority to inter- and multidisciplinary research.

Abt, H.A. (2007), The future of single-authored papers. *Scientometrics*, **73** (3), 353-358.

Full Text: [2007\Scientometrics73, 353.pdf](2007/Scientometrics73,%20353.pdf)

Abstract: The fractions of single-authored papers in four science fields (astronomy, physics, chemistry, and biology) were determined at five-year intervals during 1975-2005. In each case the distribution is best fitted with an exponential function that never reaches zero, implying that single-authored papers will continue to be published in the foreseeable future. This is contrary to the prediction that they would become extinct.

? White, H.D. (2008), Katherine W. McCain wins the 2007 Derek John de Solla Price medal. *Scientometrics*, **74** (1), 5-6.

Full Text: [2008\Scientometrics74, 5.pdf](2008/Scientometrics74,%205.pdf)

? White, H.D. (2008), Katherine McCain: Recipient of the 2007 Derek de Solla Price Award of the journal Scientometrics. *Scientometrics*, **74** (1), 7-10.

Full Text: [2008\Scientometrics74, 7.pdf](2008/Scientometrics74,%207.pdf)

? Glänzel, W. (2008), Preface. *Scientometrics*, **74** (1), 13-14.

Full Text: [2008\Scientometrics74, 13.pdf](2008/Scientometrics74,%2013.pdf)

? Bonaccorsi, A. and Daraio, C. (2008), The differentiation of the strategic profile of higher education institutions. New positioning indicators based on microdata. *Scientometrics*, **74** (1), 15-37.

Full Text: [2008\Scientometrics74, 15.pdf](2008/Scientometrics74,%2015.pdf)

Abstract: We address the issue of differentiation of the profile of universities and offer a set of new indicators based on microdata at the individual level and the application of robust nonparametric efficiency measures. In particular, we use efficiency measures in order to characterize the way in which universities use their inputs (academic and non academic staff, funding) in the effort to position themselves in the space of output (undergraduate teaching, postgraduate education, fundamental research, contract research, third mission), while keeping efficiency under control. The strategic problem of universities is defined as making best use of existing resources in the short run, while enlarging the scope of autonomy in procuring additional resources in the long run. In order to make best use of resources universities are led to increase their specialization and differentiate their offering profile. This happens even if the European institutional landscape does not encourage universities to differentiate.

Keywords: Education, Higher Education, Indicators, Productivity, Research, Universities

? Butler, L. (2008), ICT assessment: Moving beyond journal outputs. *Scientometrics*, **74** (1), 39-55.

Full Text: [2008\Scientometrics74, 39.pdf](2008/Scientometrics74,%2039.pdf)

Abstract: There are increasing moves to deploy quantitative indicators in the assessment of research, particularly in the university sector. In Australia, discussions surrounding their use have long acknowledged the unsuitability of many standard quantitative measures for most humanities, arts, social science, and applied science disciplines. To fill this void, several projects are running concurrently. This paper details the methodology and initial results for one of the projects that aims to rank conferences into prestige tiers, and which is fast gaining a reputation for best practice in such exercises. The study involves a five-stage process: identifying conferences, constructing a preliminary ranking of these, engaging in extensive consultation, testing performance measures based on the rankings on ‘live’ data, and assessing the measures. In the past, many similar attempts to develop a ranking classification for publication outlets have faltered due to the inability of researchers to agree on a hierarchy. However the Australian experience suggests that when researchers are faced with the imposition of alternative metrics that are far less palatable, consensus is more readily achieved.

Keywords: Assessment, Australia, Humanities, Indicators, Journal, Publication, Ranking, Rankings, Research, Science, Testing

? Chen, L. and Rousseau, R. (2008), Q-measures for binary divided networks: Bridges between German and English institutes in publications of the Journal of Fluid Mechanics. *Scientometrics*, **74** (1), 57-69.

Full Text: [2008\Scientometrics74, 57.pdf](2008/Scientometrics74,%2057.pdf)

Abstract: Q-measures for binary divided networks were introduced in 2004. These measures can value the status of notes as linkage (or bridges) between two groups in a connected undirected network. We collected data from the Web of Science and used a computer programme in order to study Qmeasures for an England-Germany collaboration network in fluid mechanics. The result indicates that Cambridge University, Manchester University, Technische Universitat Berlin, the Max Planck Institute, Stuttgart University and Forschungszentrum Karlsruhe play the most important roles as bridges between England and Germany. It is shown that having a high degree centrality and being a key node are important factors explaining the ranking of nodes in a network according to Q-value. It is observed that institutes with a high Q-value have, on average, a higher production than those with a lower Q-value.

Keywords: Collaboration, Germany, Network, Publications, Ranking, Web of Science

? Glänzel, W., Debackere, K. and Meyer, M. (2008), ‘Triad’ or ‘tetrad’? On global changes in a dynamic world. *Scientometrics*, **74** (1), 71-88.

Full Text: [2008\Scientometrics74, 71.pdf](2008/Scientometrics74,%2071.pdf)

Abstract: The US-EU race for world leadership in science and technology has become the favourite subject of recent studies. Studies issued by the European Commission reported the increase of the European share in the world’s scientific production and announced world leadership of the EU in scientific output at the end of the last century. In order to be able to monitor those types of global changes, the present study is based on the 15-year period 1991-2005. A set of bibliometric and technometric indicators is used to analyse activity and impact patterns in science and technology output. This set comprises publication output indicators such as (1) the share in the world total, (2) subject-based publication profiles, (3) citation-based indicators like journal-and subject-normalised mean citation rates, (4) international co-publications and their impact as well as (5) patent indicators and publication-patent citation links (both directions). The evolution of national bibliometric profiles, ‘scientific weight’ and science-technology linkage patterns are discussed as well. The authors show, using the mirror of science and technology indicators, that the triad model does no longer hold in the 21(st) century. China is challenging the leading sciento-economic powers and the time is approaching when this country will represent the world’s second largest potential in science and technology. China and other emerging scientific nations like South Korea, Taiwan, Brazil and Turkey are already changing the balance of power as measured by scientific production, as they are at least in part responsible for the relative decline of the former triad.

Keywords: America, Bibliometric, Brazil, China, Citation, EU, Indicators, Leadership, Nations, Publication, Science, Science and Technology, Science-Technology Linkage, Scientific Output, Scientific Production

? Gamber, T., Friedrich-Nishio, M. and Grupp, H. (2008), Science and technology in standardization: A statistical analysis of merging knowledge structures. *Scientometrics*, **74** (1), 89-108.

Full Text: [2008\Scientometrics74, 89.pdf](2008/Scientometrics74,%2089.pdf)

Abstract: The objective of this paper is to depict the knowledge array of standards. This is done by identifying and analyzing external effects, specifically spillover effects. The database used is Perinorm. We use a cluster analysis in order to create groups of technology fields for German standards according to the fields of the International Classification of Standards. Methodologically, the distances between these objects or clusters are defined by the chosen distance measure, which in turn is determined by the sum of their cross references. The applied joining clustering method uses these distances between the objects and allows the data to be mapped within a two dimensional space. The results of this mapping show the existence of structures within the standards data fitting to the well-known structure of patent spillovers.

Keywords: Analysis, Innovations, Statistical Analysis

? Lariviere, V., Zuccala, A. and Archambault, E. (2008), The declining scientific impact of theses: Implications for electronic thesis and dissertation repositories and graduate studies. *Scientometrics*, **74** (1), 109-121.

Full Text: [2008\Scientometrics74, 109.pdf](2008/Scientometrics74,%20109.pdf)

Abstract: Although the writing of a thesis is a very important step for scientists undertaking a career in research, little information exists on the impact of theses as a source of scientific information. Knowing the impact of theses is relevant not only for students undertaking graduate studies, but also for the building of repositories of electronic theses and dissertations (ETD) and the substantial investment this involves. This paper shows that the impact of theses as information sources has been generally declining over the last century, apart from during the period of the ‘golden years’ of research, 1945 to 1975. There is no evidence of ETDs having a positive impact, on the contrary, since their introduction the impact of theses has actually declined more rapidly. This raises questions about the justification for ETDs and the appropriateness of writing monograph style theses as opposed to publication of a series of peer-reviewed papers as the requirement for fulfilment of graduate studies.

Keywords: Citations, Collections, Doctoral Dissertation, Library, Peer-Reviewed, PhD, Publication, Research, Sciences, Scientific Information, Students, Trends

? Larsen, K. (2008), Knowledge network hubs and measures of research impact, science structure, and publication output in nanostructured solar cell research. *Scientometrics*, **74** (1), 123-142.

Full Text: [2008\Scientometrics74, 123.pdf](2008/Scientometrics74,%20123.pdf)

Abstract: This study on co-authorship networks in the area of nanostructured solar cells aims to contribute to a further understanding of the use of research evaluation measures of science output, impact and structure in an emerging research field. The study incorporates quantitative bibliometric methods of analysis and social network analysis in combination with a qualitative case study research approach. Conclusions drawn from the results emphasise, firstly, the importance of distinguishing between early and later phases of the evolution of a novel research field, and secondly, the application of a systemic view on learning processes and knowledge diffusion in a science-based technology field.

Keywords: Analysis, Bibliometric, Bibliometric Methods, Citations, Co-Authorship, Co-Authorship Networks, Coauthorship, Diffusion, Dynamics, Evaluation, Field, Interdisciplinarity, Nanoscience, Nanotechnology, Network, Network Analysis, Patterns, Publication, Research, Research Collaboration, Research Evaluation, Science, Scientific Literature, Social Network Analysis, Technology

? Lo, S.C. (2008), Patent coupling analysis of primary organizations in genetic engineering research. *Scientometrics*, **74** (1), 143-151.

Full Text: [2008\Scientometrics74, 143.pdf](2008/Scientometrics74,%20143.pdf)

Abstract: The aim of this study is to reveal the possible linkage among the 40 primary organizations in Genetic Engineering Research by taking the Patent Coupling approach. The primary organizations were defined by the productivity and identified by the patent count and Bradford Law. The author analyzed the cited patents of the patents granted by United States Patent and Trademark Office (USPTO) from 1991 to 2002 to the 40 primary organizations (assignees) in Genetics Engineering Research to establish the correlation. 780 coupling pairs formed by the 40 primary organizations and Coupling Index and Coupling Strength were calculated for each pair and primary organization. Correlation Analysis and Multiple-Dimension Scaling were applied further based on Coupling Index. Technological clusters were found in the results of the analyses.

Keywords: Analysis, Basic Research Literature, Biotechnology, Indicators, Patents, Primary, Research, Science

? Moed, H.F. (2008), UK research assessment exercises: Informed judgments on research quality or quantity? *Scientometrics*, **74** (1), 153-161.

Full Text: [2008\Scientometrics74, 153.pdf](2008/Scientometrics74,%20153.pdf)

Abstract: A longitudinal analysis of UK science covering almost 20 years revealed in the years prior to a Research Assessment Exercise (RAE 1992, 1996 and 2001) three distinct bibliometric patterns, that can be interpreted in terms of scientists’ responses to the principal evaluation criteria applied in a RAE. When in the RAE 1992 total publications counts were requested, UK scientists substantially increased their article production. When a shift in evaluation criteria in the RAE 1996 was announced from ‘quantity’ to ‘quality’, UK authors gradually increased their number of papers in journals with a relatively high citation impact. And during 1997-2000, institutions raised their number of active research staff by stimulating their staff members to collaborate more intensively, or at least to co-author more intensively, although their joint paper productivity did not. This finding suggests that, along the way towards the RAE 2001, evaluated units in a sense shifted back from ‘quality’ to ‘quantity’. The analysis also observed a slight upward trend in overall UK citation impact, corroborating conclusions from an earlier study. The implications of the findings for the use of citation analysis in the RAE are briefly discussed.

Keywords: Analysis, Assessment, Bibliometric, Citation, Citation Analysis, Evaluation, Impact, Journals, Publications, Quality, Research, Research Assessment, Research Quality, Science

? Nederhof, A.J. (2008), Policy impact of bibliometric rankings of research performance of departments and individuals in economics. *Scientometrics*, **74** (1), 163-174.

Full Text: [2008\Scientometrics74, 163.pdf](2008/Scientometrics74,%20163.pdf)

Abstract: This paper examines policy-relevant effects of a yearly public ranking of individual researchers and their institutes in economics by means of their publication output in international top journals. In 1980, a grassroots ranking (‘Top 40’) of researchers in the Netherlands by means of their publications in international top journals started a competition among economists. The objective was to improve economics research in the Netherlands to an internationally competitive level. The ranking lists did stimulate output in prestigious international journals. Netherlands universities tended to perform well compared to universities elsewhere in the EU concerning volume of output in ISI source journals, but their citation impact was average. Limitations of ranking studies and of bibliometric monitoring in the field of economics are discussed.

Keywords: Growth, Growth Rate, h Index, h-Index, Hirsch, Impact, Institutions, Journals, Methodology, Papers, Population, Rank, Ranking, Scientific Institutions, Scientific Production, Size, Universities, Visibility, Work

? Sandström, U. and Hällsten, M. (2008), Persistent nepotism in peer-review. *Scientometrics*, **74** (2), 175-189.

Full Text: [2008\Scientometrics74, 175.pdf](2008/Scientometrics74,%20175.pdf)

Abstract: In a replication of the high-profile contribution by Wenneras and Wold on grant peer-review, we investigate new applications processed by the medical research council in Sweden. Introducing a normalisation method for ranking applications that takes into account the differences between committees, we also use a normalisation of bibliometric measures by field. Finally, we perform a regression analysis with interaction effects. Our results indicate that female principal investigators (PIs) receive a bonus of 10% on scores, in relation to their male colleagues. However, male and female PIs having a reviewer affiliation collect an even higher bonus, approximately 15%. Nepotism seems to be a persistent problem in the Swedish grant peer review system.

Keywords: Affiliation, Analysis, Bibliometric, Gender-Differences, Interaction, Medical, Peer Review, Peer-Review, Ranking, Research, Science, Scientific Productivity, Sex-Differences

? Shelton, R.D. (2008), Relations between national research investment and publication output: Application to an American Paradox. *Scientometrics*, **74** (2), 191-205.

Full Text: [2008\Scientometrics74, 191.pdf](2008/Scientometrics74,%20191.pdf)

Abstract: The term ‘European Paradox’ describes the perceived failure of the EU to capture full benefits of its leadership of science as measured by publications and some other indicators. This paper investigates what might be called the ‘American Paradox,’ the decline in scientific publication share of the U.S. despite world-leading investments in research and development (R&D) - particularly as that decline has accelerated in recent years. A multiple linear regression analysis was made of which inputs to the scientific enterprise are most strongly correlated with the number of scientific papers produced. Research investment was found to be much more significant than labor input, government investment in R&D was much more significant than that by industry, and government non-defense investment was somewhat more significant than its defense investment. Since the EU actually leads the U.S. in this key component, this could account for gradual loss of U.S. paper share and EU assumption of leadership of scientific publication in the mid-1990s. More recently the loss of U.S. share has accelerated, and three approaches analyzed this phenomenon: (1) A companion paper shows that the SCI database has not significantly changed to be less favorable to the U.S., thus the decline is real and is not an artifact of the measurement methods. (2) Budgets of individual U.S. research agencies were correlated with overall paper production and with papers in their disciplines. Funding for the U.S. government civilian, non-healthcare sector was flat in the last ten years, resulting in declining share of papers. Funding for its healthcare sector sharply increased, but there were few additional U.S. healthcare papers. While this inefficiency contributes to loss of U.S. share, it is merely a specific example of the general syndrome that increased American investments have not produced increased publication output. (3) In fact the decline in publication share appears to be due to rapidly increasing R&D investments by China, Taiwan, S. Korea, and Singapore. A model shows that in recent years it is a country’s share of world investment that is most predictive of its publication share. While the U.S. has increased its huge R&D investment, its investment share still declined because of even more rapidly increasing investments by these Asian countries. This has likely led to their sharply increased share of scientific publication, which must result in declines of shars of others - the U.S. and more recently, the EU.

Keywords: Analysis, China, Development, EU, Indicators, Leadership, Measurement, Publication, Publications, Research, Research and Development, SCI, Science

? Small, H., Kushmerick, A. and Benson, D. (2008), Scientists’ perceptions of the social and political implications of their research. *Scientometrics*, **74** (2), 207-221.

Full Text: [2008\Scientometrics74, 207.pdf](2008/Scientometrics74,%20207.pdf)

Abstract: We explore an empirical approach to studying the social and political implications of science by gathering scientists’ perceptions of the social impacts of their research. It was found that 78 percent of surveyed scientists from a variety of fields responding to a survey indicated that the research performed in connection with a recent highly cited paper had such implications. Health related implications were the most common, but other types of implications encountered were technological spin-offs, public understanding, economic and policy benefits. Surprisingly many scientists considered the advancement of science itself to be a social implication of their research. The relations of these implications to the field and topics of research are examined, and a mapping of implications gives an overview of the major dimensions of the social impacts of science.

Keywords: Research, Science

? Thijs, B. and Glänzel, W. (2008), A structural analysis of publication profiles for the classification of European research institutes. *Scientometrics*, **74** (2), 223-236.

Full Text: [2008\Scientometrics74, 223.pdf](2008/Scientometrics74,%20223.pdf)

Abstract: In the present study we propose a solution for a common problem in benchmarking tasks at institutional level. The usage of bibliometric indicators, even after standardisation, cannot disguise that comparing institutes remains often like comparing apples with pears. We developed a model to assign institutes to one of 8 different groups based on their research profile. Each group has a different focus: 1. Biology, 2. Agricultural Sciences, 3. Multidisciplinary, 4. Geo & Space Sciences, 5. Technical and natural Sciences, 6. Chemistry, 7. General and Research Medicine, 8. Specialised Medicine. Two applications of this methodology are described. In the first application we compare the composition of clusters at national level with the national research profiles. This gives a deeper insight in the national research landscape. In a second application we look at the dynamics of institutes by comparing their subject clustering at two different points in time.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Indicators, Publication, Research, Science, Solution

? Vinkler, P. (2008), Correlation between the structure of scientific research, scientometric indicators and GDP in EU and non-EU countries. *Scientometrics*, **74** (2), 237-254.

Full Text: [2008\Scientometrics74, 237.pdf](2008/Scientometrics74,%20237.pdf)

Abstract: Significant discrepancies were found in the ratio and relative impact of the journal papers of several scientific fields of some Central and Eastern European (CEE) countries compared to the European Community member states, the US and Japan (EUJ countries). A new indicator, characterizing the Mean Structural Difference of scientific fields between countries has been introduced and calculated for CEE countries. For EUJ countries correlation between the GDP and number of publications of a given year proved to be non-significant. Longitudinal studies showed, however, significant correlations between the yearly values of GDP and number of papers published. Studying data referring to consecutive time periods revealed that there is no direct relationship between the GDP and information production of countries. It may be assumed that grants for R&D do not actually depend on real needs, but the fact is that rich countries can afford to spend more whilst poor countries only less money on scientific research.

Keywords: EU, Impact, Indicators, Information, Journal, Nations, Publications, Research, Science, Scientific Research, Scientometric, US

? Bar-Ilan, J. (2008), Which h-index? - A comparison of WoS, Scopus and Google Scholar. *Scientometrics*, **74** (2), 257-271.

Full Text: [2008\Scientometrics74, 257.pdf](2008/Scientometrics74,%20257.pdf)

Abstract: This paper compares the h-indices of a list of highly-cited Israeli researchers based on citations counts retrieved from the Web of Science, Scopus and Google Scholar respectively. In several case the results obtained through Google Scholar are considerably different from the results based on the Web of Science and Scopus. Data cleansing is discussed extensively.

Keywords: Citation Analysis, Citations, Comparison, h Index, h-Index, Journals, Numbers, Scientists, Scopus, Search, Web of Science

? Kousha, K. and Thelwall, M. (2008), Sources of Google Scholar citations outside the Science Citation Index: A comparison between four science disciplines. *Scientometrics*, **74** (2), 273-294.

Full Text: [2008\Scientometrics74, 273.pdf](2008/Scientometrics74,%20273.pdf)

Abstract: For practical reasons, bibliographic databases can only contain a subset of the scientific literature. The ISI citation databases are designed to cover the highest impact scientific research journals as well as a few other sources chosen by the Institute for Scientific Information (ISI). Google Scholar also contains citation information, but includes a less quality controlled collection of publications from different types of web documents. We define Google Scholar unique citations as those retrieved by Google Scholar which are not in the ISI database. We took a sample of 882 articles from 39 open access ISI-indexed journals in 2001 from biology, chemistry, physics and computing and classified the type, language, publication year and accessibility of the Google Scholar unique citing sources. The majority of Google Scholar unique citations (70%) were from full-text sources and there were large disciplinary differences between types of citing documents, suggesting that a wide range of non-ISI citing sources, especially from non-journal documents, are accessible by Google Scholar. This might be considered to be an advantage of Google Scholar, since it could be useful for citation tracking in a wider range of open access scholarly documents and to give a broader type of citation impact. An important corollary from our study is that Google Scholar’s wider coverage of Open Access (OA) web documents is likely to give a boost to the impact of OA research and the OA movement.

Keywords: Articles, Biology, Chemistry, Citation, Citations, Communication, Comparison, Impact Factors, Information, Institute for Scientific Information, ISI, Journal Web Sites, Journals, Library, Links, Literature, Motivations, Open Access, Publication, Publications, Quality, Research, Research Journals, Science, Science Citation Index, Scientific Research, Web

? Ortega, J.L., Aguillo, I., Cothey, V. and Scharnhorst, A. (2008), Maps of the academic web in the European Higher Education Area - an exploration of visual web indicators. *Scientometrics*, **74** (2), 295-308.

Full Text: [2008\Scientometrics74, 295.pdf](2008/Scientometrics74,%20295.pdf)

Abstract: This paper shows maps of the web presence of the European Higher Education Area (EHEA) on the level of universities using hyperlinks and analyses the topology of the European academic network. Its purpose is to combine methods from Social Network Analysis (SNA) and cybermetric techniques in order to ask for tendencies of integration of the European universities visible in their web presence and the role of different universities in the process of the emergence of an European Research Area. We find as a main result that the European network is set up by the aggregation of well-defined national networks, whereby the German and British networks are dominant. The national networks are connected to each other through outstanding national universities in each country.

Keywords: Collaboration, Graph Structure, Indicators, Network, Network Structure, Science, Space, Universities, Web, World-Wide-Web

? Smith, A.G. (2008), Benchmarking Google Scholar with the New Zealand PBRF research assessment exercise. *Scientometrics*, **74** (2), 309-316.

Full Text: [2008\Scientometrics74, 309.pdf](2008/Scientometrics74,%20309.pdf)

Abstract: Google Scholar was used to generate citation counts to the web-based research output of New Zealand Universities. Total citations and hits from Google Scholar correlated with the research output as measured by the official New Zealand Performance-Based Research Fund (PBRF) exercise. The article discusses the use of Google Scholar as a cybermetric tool and methodology issues in obtaining citation counts for institutions. Google Scholar is compared with other tools that provide web citation data: Web of Science, SCOPUS, and the Wolverhampton Cybermetric Crawler.

Keywords: Assessment, Citation, Citation Counts, Citations, Research, Research Assessment, Web, Web of Science

? Vaughan, L. and Shaw, D. (2008), A new look at evidence of scholarly citation in citation indexes and from web sources. *Scientometrics*, **74** (2), 317-330.

Full Text: [2008\Scientometrics74, 317.pdf](2008/Scientometrics74,%20317.pdf)

Abstract: A sample of 1,483 publications, representative of the scholarly production of LIS faculty, was searched in Web of Science (WoS), Google, and Google Scholar. The median number of citations found through WoS was zero for all types of publications except book chapters, the median for Google Scholar ranged from 1 for print, subscription journal articles to 3 for books and book chapters. For Google the median number of citations ranged from 9 for conference papers to 41 for books. A sample of the web citations was examined and classified as representing intellectual or non-intellectual impact. Almost 92% of the citations identified through Google Scholar represented intellectual impact - primarily citations from journal articles. Bibliographic services (non-intellectual impact) were the largest single contributor of citations identified through Google. Open access journal articles attracted more web citations but the citations to print, subscription journal articles more often represented intellectual impact. In spite of problems with Google Scholar, it has the potential to provide useful data for research evaluation, especially in a field where rapid and fine-grained analysis is desirable.

Keywords: Analysis, Citation, Citation Indexes, Citations, Evaluation, Faculty, Google-Scholar, Greater Research Impact, Journal, Journal Articles, Library, LIS, of-Science, Open-Access Articles, Publications, Research, Research Evaluation, Scopus, Web, Web of Science

? Miguel, S., Moya-Anegón, F. and Herrero-Solana, V. (2008), New approach to institutional domain analysis: Multilevel research fronts structure. *Scientometrics*, **74** (3), 331-344.

Full Text: [2008\Scientometrics74, 331.pdf](2008/Scientometrics74,%20331.pdf)

Abstract: The intellectual structure and main research fronts of the Faculty of Natural Sciences and Museum of the National University of La Plata, Argentina is studied, based on the cocitation analysis of subject categories, journals and authors of their scientific publications collected in the Science Citation index, CD-ROM version, for the period 1991-2000. The objective of this study is to test the utility of those techniques to explore and to visualize the intellectual structure and research fronts of multidisciplinary institutional domains. Special emphasis is laid on the identification of multilevel structures, by means of arrangements of subject categories cocitation analysis and journal cocitation analysis.

Keywords: Analysis, Argentina, Author Cocitation Analysis, Cocitation, Decision-Support Systems, Domain Analysis, Identification, Intellectual Structure, Journal, Journals, Multidisciplinary, Publications, Research, Research Fronts, Science, Scientific Publications, Semiconductor Literature, Structure, Techniques, Utility

? Yoon, Y.H. and Young, K.S. (2008), Correlation analysis between university research competitiveness and library’s scholarly information in OECD nations and Korea. *Scientometrics*, **74** (3), 345-360.

Full Text: [2008\Scientometrics74, 345.pdf](2008/Scientometrics74,%20345.pdf)

Abstract: Beginning from the premise that research competitiveness at the university level is the starting point for national competitiveness as a whole, this paper analyzes the correlation between university research-related performance and the scholarly or academic resources available through a country’s library system. An analysis of this correlation from two different angles - a macroscopic approach considering universities in OECD nations and a microscopic approach focusing only upon universities in Korea - found that there is indeed a significant correlation between university research performance and the scholarly information available at libraries. A regression analysis of the two approaches also found that the more journal titles subscribed to by university libraries and the higher their budget for materials, the greater the contribution university libraries make to university research competitiveness in Korea as well as other OECD countries. In this light, in order for Korea to reach a level of research competitiveness comparable to other OECD members, policies need to be created that will effectively increase the number of journals subscribed to by university libraries.

Keywords: Analysis, Budget, Higher-Education, Information, Journal, Journals, Korea, Nations, Productivity, Regression Analysis, Research, Research Performance, Universities, University

? Schmoch, U. and Schubert, T. (2008), Are international co-publications an indicator for quality of scientific research? *Scientometrics*, **74** (3), 361-377.

Full Text: [2008\Scientometrics74, 361.pdf](2008/Scientometrics74,%20361.pdf)

Abstract: This article deals with the role of internationally co-authored papers (co-publications). Specifically, we compare, within a data-set of German research units, citation and co-publication indicators as a proxy for the unobserved quality dimension of scientific research. In that course we will also deal with the question whether both citations and co-publications are considerably related. Our results suggest that, although there is a strong partial correlation between citations and co-publications within a multivariate setting, we cannot use reasonably normalised co-publication indicators as an alternative proxy for quality. Thus, concerning quality assessment, there remains a primer on citation analysis.

Keywords: Alternative, Analysis, Assessment, Authorship, Bibliometric Indicators, Citation, Citation Analysis, Citations, Collaboration, Correlation, Course, Impact, Indicator, Indicators, International, MAR, Multivariate, Papers, Quality, Quality of, Research, Role, Scientific Research, System, Teams

Amat, C.B. (2008), Editorial and publication delay of papers submitted to 14 selected Food Research journals. Influence of online posting. *Scientometrics*, **74** (3), 379-389.

Full Text: [2008\Scientometrics74, 379.pdf](2008/Scientometrics74,%20379.pdf)

Abstract: Introduction: Publication delay, chronological distance between completion of a scientific work and distribution of its achievements as a peer reviewed paper, is a negative phenomenon in scientific information dissemination. It can be further subdivided in successive stages corresponding to the peer review process and the technical preparation of accepted manuscripts. Formal online posting in electronic versions of journals has been considered as a shortening of the process. Objectives: To determine publication delay in a group of leading Food Research journals, as well as factors affecting this lag and also to compute the effect of formal online posting on the distribution of papers in electronic form. Secondary objective is also to study the possible effect of informal posting of papers through some repositories on the publication delay in the field. Methods: 14 Food Research journals were selected and 4836 papers published in 2004 were examined. Dates of first submission, submission of revised manuscripts, acceptation, online posting and final publication were recorded for each paper. Analysis: Data collected were analyzed using SPSS and SigmaPlot. Parametric correlation between some variables was determined and ANOVA was performed with BMDP package for significance analysis of differences among journals. Results: average publication delay of papers submitted to the set of selected journals is 348 :h 104 days, with European Food Research and Technology and Journal of Agricultural and Food Chemistry showing the shortest delays. Total delay strongly depends on the peer review process. On average, 85.75% of manuscripts are corrected prior to their acceptance by journals. Online posting of papers prior to their print publication reduces total delay in about 29%. On average, a paper is posted online 260 days after its submission to the set of journals. Conclusions: Publication delay of papers is strongly dependent on the peer review process, which affects most of the manuscripts in the Food Research field. Advanced online publication through formal posting at the editor’s sites only slightly reduces the time between reception and final publication of papers.

Keywords: Acceptance, Analysis, Analytical-Chemistry, Authors, Dissemination, First, Information, Journals, Lapse, Papers, Peer Review, Peer-Review, Peer-Reviewed, Preparation, Publication, Publication Delay, Review, Review Process, Science, Scientific Information, Scientific Literature, Speed, Work

? Kivinen, O. and Hedman, J. (2008), World-wide university rankings: A Scandinavian approach. *Scientometrics*, **74** (3), 391-408.

Full Text: [2008\Scientometrics74, 391.pdf](2008/Scientometrics74,%20391.pdf)

Abstract: Although universities’ world rankings are popular, their design and methods still request considerable elaborations. The paper demonstrates some shortcomings in the Academic World Ranking of Universities (ARWU, Shanghai Jiao Tong University) ranking methods. One deficiency is that universities’ scale differences are neglected due to omitting the whole input side. By resampling and reanalyzing the ARWU data, the paper proposes an input-output analysis for measuring universities’ scientific productivity with special emphasis on those universities which meet the productivity threshold (i.e. share of output exceeds share of input) in a certain group of universities. The productivity analysis on Scandinavian universities evaluates Multidisciplinary and specialized universities on their own terms, consequently the ranking based on scientific productivity deviates significantly from the ARWU.

Keywords: Analysis, Fatal Attraction, Methods, Ranking, Rankings, Universities, University

? Gokceoglu, C., Okay, A.I. and Sezer, E. (2008), International earth science literature from Turkey - 1970-2005: Trends and possible causes. *Scientometrics*, **74** (3), 409-423.

Full Text: [2008\Scientometrics74, 409.pdf](2008/Scientometrics74,%20409.pdf)

Abstract: We investigated the publication trends in the international earth science literature coming out of Turkey in the period of 1970-2005 using the Science Citation Index Expanded database. A database of 23 10 earth science publications with at least one of the authors with an address in Turkey was compiled. The number of earth science publications from Turkey shows a very rapid increase starting in the 1990’s in parallel with the increase in the total scientific output of Turkey. In the last decade the annual growth rate has been 16%. There was also a concomitant increase in the number of citations. The causes of the sharp increase in the publication numbers are, in order of importance, changes in the rules of academic promotion and appointment, changes in academic attitudes towards publishing, increasing support for research, financial incentives for publishing, and expansion of higher education. However, the sharp increase in the publication numbers was not accompanied by a similar increase in the impact of the publications as measured by the citations. Although publications with first authors from outside Turkey make up only 20% of the Turkish earth science publications in the period 1970-2005, these account for 38% of the total citations, and constitute 48 out of 100 most cited papers.

Keywords: Academic Promotion, Attitudes, Changes, China, Citations, Coesite, Dabie-Shan, Database, Diamond, Education, Eurasia, Evolution, Financial Incentives, First, Growth, Growth Rate, Higher Education, International, Landslide Susceptibility, Literature, North Anatolian Fault, Papers, Patterns, Promotion, Publication, Publications, Publishing, Research, Science, Science Citation Index, Scientific Output, Trends, Turkey, Zone

? de Araújo, A.F.P. (2008), Increasing discrepancy between absolute and effective indexes of research output in a Brazilian academic department. *Scientometrics*, **74** (3), 425-437.

Full Text: [2008\Scientometrics74, 425.pdf](2008/Scientometrics74,%20425.pdf)

Abstract: We investigate possible effects from a strong encouragement for a large number of publications on the scientific production of a Brazilian cell biology department. An average increase in individual absolute production and a concomitant decrease in individual participation in each paper were detected by traditional bibliometric parameters, such as number of publications, citations, impact factors and h index, combined to their ‘effective’ versions, in which co-authorship is taken into consideration. The observed situation, which might well represent a national trend, should be considered as a strong wanting against current criteria of scientific evaluation heavily based on uncritical counting of publications.

Keywords: Bibliometric, Biology, Citations, Co-Authorship, Coauthorship, Collaboration, Criteria, Evaluation, h Index, h-Index, Impact, Impact Factors, Index, Latin-America, MAR, Participation, Publications, Recognition, Research, Science, Scientific Cooperation, Scientific Production, Trend

? Frandsen, T.F. (2008), On the ratio of citable versus non-citable items in economics journals. *Scientometrics*, **74** (3), 439-451.

Full Text: [2008\Scientometrics74, 439.pdf](2008/Scientometrics74,%20439.pdf)

Abstract: This paper presents a study of possible changes in patterns of document types in economics journals since the mid-1980s. Furthermore, the study includes an analysis of a possible relation between the profile of a journal concerning composition of document types and factors such as place of publication and JIF. The results provide little evidence that the journal editors have succeeded in manipulating the distribution of document types. Furthermore, there is little support for the hypothesis that journal editors decrease the number of publications included in the calculation of JIF or for that matter for the hypothesis that journal editors increase the number of publications not included in the calculation of JIF. The results of the analyses show that there is a clear distinction of journals based on place of publication and JLF.

Keywords: Analysis, Changes, Economics, Evidence, Impact Factors, Institute, Journal, Journal Editors, Journals, Publication, Publications

? Biglu, M.H. (2008), The influence of references per paper in the SCI to Impact Factors and the Matthew Effect. *Scientometrics*, **74** (3), 453-470.

Full Text: [2008\Scientometrics74, 453.pdf](2008/Scientometrics74,%20453.pdf)

Abstract: All references data was extracted from the annual volumes of the CD-Edition of Science Citation Index (SCI) and the Web of Science of the Institute for Scientific Information (ISI), the journal citation and self-citation data extracted from the Journal Citation Report (JCR), the self-citing rate and self-cited rate calculated based on the JCR method. To determine the trend of mean value of references per paper throughout 1970-2005, a total number of 10,000 records were randomly chosen for each year of under study, and the mean value of references per paper was calculated. To determine the growth of journals IF a total number of 5,499 journals were chosen in the JCR in 2002 and the same set of journals in the year 2004. To show the trend of journals IF, all journals indexed in the JCR throughout 1999-2005 were extracted and the mean values of their IFs was calculated annually. The study showed that the number of references per paper from 1970 to 2005 has steady increased. It reached from 8.40 in 1970 to 34.63 in 2005, an increase of more than 4 times. The majority of publications (76.17%) were in the form of Journals Article. After articles, Meeting Abstracts (9.46%), Notes (3.90%) and Editorial Material (3.78%) are the most frequented publication forms, respectively. 94.57% of all publications were in English. After English, German (1.50%), Russian (1.48%) and French (1.37%) were the most frequented languages, respectively. The study furthermore showed that there is a significant correlation between the IF and total citation of journals in the JCR, and there is an important hidden correlation between IF and the self-citation of journals. This phenomena causes the elevation of journals IF. The more often a journal is citing other journals, the more often it is also cited (by a factor of 1.5) by others. In consequence the growing percentage of journal self-citation is followed by journal self-citedness, which can be considered as the Matthew Effect. There is a linear correlation between journal self-citing and journal self-cited value, the mean value of self-cited rate always stays higher than the self-citing rate. The mean value of self-cited rate in 2000 was 1.4% and the mean value of self-citing rate is 6.61%, whereas the mean value of self-cited rate in 2005 was 12% and the mean value of self-citing rate was 7.81%.

Keywords: Citation, Growth, Institute for Scientific Information, ISI, Journal, Journal Self-Cited, Journal Self-Citing, Journals, Languages, Publication, Publications, Records, SCI, Science, Science Citation Index, Self-Citation, Web of Science

? Jang, Y.C. (2008), Locating active actors in the scientific collaboration communities based on interaction topology analyses. *Scientometrics*, **74** (3), 471-482.

Full Text: [2008\Scientometrics74, 471.pdf](2008/Scientometrics74,%20471.pdf)

Abstract: while implementing a large-scale research project, it is necessary to appoint some principle scientists, and let each principle scientist lead a research group. In a scientific collaboration community, different scientists perform different roles while they implement the project, and some scientists may be more active than others, these active scientists often undertake the role of leadership or key coordinator in the project. Obviously, we should assign the role of principle scientists onto those active actors in the communities. In this paper, we present the model and algorithms for locating active actors in the community based on the analyses of scientists’ interaction topology, the actors with high connection degrees in the interaction topology can be considered as active ones. Finally, we make some case studies for our model and algorithms.

Keywords: Case Studies, Collaboration, Community, Cooperation, Coordinator, Interaction, Lead, Leadership, Model, Networks, Research, Scientific Collaboration

? Seol, S.S. and Park, J.M. (2008), Knowledge sources of innovation studies in Korea: A citation analysis. *Scientometrics*, **75** (1), 3-20.

Full Text: [2008\Scientometrics75, 3.pdf](2008/Scientometrics75,%203.pdf)

Abstract: This paper is an investigation of the knowledge sources of Korean innovation studies using citation analysis, based on a Korean database during 1993-2004. About two thirds of knowledge has come from foreign sources and 94% of them are from English materials. Research Policy is the most frequently cited journal followed by Harvard Business Review, R&D Management and American Economic Review. An analysis of who cites the most highly cited journal is also included. Neo-Schumpeterians in Korea cite more papers from Research Policy than general researchers, and there is no difference between groups in the year of citation.

Keywords: Analysis, Author Self-Citations, Citation, Citation Analysis, Counts, Database, Flows, Indicators, Innovation, Investigation, Journal, Knowledge, Korea, Macro, Management Journals, Papers, Patterns, Perspective, Science, System

? Lewison, G. and Kundra, R. (2008), The internal migration of Indian scientists, 1981-2003, from an analysis of surnames. *Scientometrics*, **75** (1), 21-35.

Full Text: [2008\Scientometrics75, 21.pdf](2008/Scientometrics75,%2021.pdf)

Abstract: Although many Indian surnames are common across the whole country, some are specifically associated with just one or a few of the 35 states and union territories that comprise India today. For example, Reddy comes from Andhra Pradesh and Das, Ghosh and Roy from West Bengal. We investigated the extent to which researchers with names associated with some of the larger states were writing scientific papers in those states, and in other ones, and to see how these concentrations (relative to the whole of India) had changed since the early 1980s. We found that West Bengalis, for example, were now significantly less concentrated in their home state than formerly, and that their concentrations elsewhere were strongly influenced by the state’s geographical distance from West Bengal and, to a lesser extent, by the correlation between the scientific profile of their host state and their own preferences (which favoured physics and engineering over biology and mathematics). Thus they were strongly represented in nearby Bihar, Assam and Orissa, and much less so in Tamil Nadu and Kerala.

Keywords: Analysis, Biology, Campobasso Province, Define Chinese Ethnicity, Identification, Inbreeding Coefficients, India, Information, Mortality, Pakistan, Papers, Populations, Science, Validity

? Chavalarias, D. and Cointet, J.P. (2008), Bottom-up scientific field detection for dynamical and hierarchical science mapping, methodology and case study. *Scientometrics*, **75** (1), 37-50.

Full Text: [2008\Scientometrics75, 37.pdf](2008/Scientometrics75,%2037.pdf)

Abstract: We propose new methods to detect paradigmatic fields through simple statistics over a scientific content database. We propose an asymmetric paradigmatic proximity metric between terms which provide insight into hierarchical structure of scientific activity and test our methods on a case study with a database made of several millions of resources. We also propose overlapping categorization to describe paradigmatic fields as sets of terms that may have several different usages. Terms can also be dynamically clustered providing a high-level description of the evolution of the paradigmatic fields.

Keywords: Case Study, Co-Word Analysis, Cocitation, Database, Evolution, Hierarchical Structure, Information, Methodology, Methods, Networks, Science, Science Mapping, Statistics, Structure

? Liu, C.Y. and Luo, S.Y. (2008), Analysis of developing a specific technological field using the theme code of Japanese patent information. *Scientometrics*, **75** (1), 51-65.

Full Text: [2008\Scientometrics75, 51.pdf](2008/Scientometrics75,%2051.pdf)

Abstract: The paper was to establish an easy and effective method to investigate and develop a specific technological field from Japanese patent information. The walking technique of the biped humanoid robot was used as an example to study the relative research capabilities and patent citation conditions for patent owners and patent map by the searching method of the theme code for FI (File Index) and F-term classification system of the Japanese Patent Office (JPO). A formulated technical matrix of patent map was established to indicate that the ZMP (Zero Moment Point) control means was the main technology to achieve stabilized walking control of the humanoid biped robot. This method can aid to establish a specific technological matrix from the specific selected term codes (single viewpoint or multiple viewpoints) of the F-term list in the theme code of the JPO system through Boolean logical operations. The resulting particular technical fields were developed to improve the technological capability or seek the merging technology opportunities.

Keywords: Citation, Classification, Indicators, Information, Output, Patent, Research, Technology

? Huang, Y., Ao, X.L. and Ho, Y.S. (2008), Use of citation per publication as an indicator to evaluate pentachlorophenol research. *Scientometrics*, **75** (1), 67-80.

Full Text: [2008\Scientometrics75, 67.pdf](2008/Scientometrics75,%2067.pdf)

Abstract: The objective of the study was to perform a bibliometric analysis of all pentachlorophenolrelated publications in the Science Citation Index (SCI). Analyzed parameters included document type, language of publication, page count, publication output, authorship, keywords plus, publication pattern, citation and country of publication. The US produced 29% of the total single country publications where the seven major industrial countries accounted for the majority of the total production (66%). An indicator citation per publication was successfully applied in this study to evaluate the impact of umber of authors, countries, and journals. The mean value of citation per publication of collaborative papers was higher than that of single country publications. In addition analysis of keywords plus in different period was applied to indicate a research trend.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Citation, Country, Degradation, Impact, Indicator, Journals, Papers, Pattern, Publication, Publications, Research, Research Trend, SCI, Science Citation Index, Trend, US, Value, Water, Wood Preservatives

Adams, J., Gurney, K. and Jackson, L. (2008), Calibrating the zoom - a test of Zitt’s hypothesis. *Scientometrics*, **75** (1), 81-95.

Full Text: [2008\Scientometrics75, 81.pdf](2008/Scientometrics75,%2081.pdf)

Abstract: Bibliometric indicators are widely used to compare performance between units operating in different fields of science. For cross-field comparisons, article citation rates have to be normalised to baseline values because citation practices vary between fields, in respect of timing and volume. Baseline citation values vary according to the level at which articles are aggregated (journal, sub-field, field). Consequently, the normalised citation performance of each research unit will depend on the level of aggregation, or ‘zoom’, that was used when the baselines were calculated. Here, we calculate the citation performance of UK research units for each of three levels of article-aggregation. We then compare this with the grade awarded to that unit by external peer review. We find that the correlation between average normalised citation impact and peerreviewed grade does indeed vary according to the selected level of zoom. The possibility that the level of ‘zoom’ will affect our assessment of relative impact is an important insight. The fact that more than one view and hence more than one interpretation of performance might exist would need to be taken into account in any evaluation methodology. This is likely to be a serious challenge unless a reference indicator is available and will generally require any evaluation to be carried out at multiple levels for a reflective review.

Keywords: Aggregation, Assessment, Challenge, Citation, Correlation, Cross-Field, Evaluation, Field, Field-Normalization, Impact, Indicator, Indicators, Journal, Methodology, Peer Judgment, Peer Review, Peer-Review, Performance, Practices, Rates, Research, Review, Science, Timing, UK, Volume

? Li, Z. and Ho, Y.S. (2008), Use of citation per publication as an indicator to evaluate contingent valuation research. *Scientometrics*, **75** (1), 97-110.

Full Text: [2008\Scientometrics75, 97.pdf](2008/Scientometrics75,%2097.pdf)

Abstract: This is the first article using bibliometrics to study the field of contingent valuation research. The purpose of this study was to evaluate the contingent valuation research performance based on all the related articles in SCI and SSCI databases from 1991 to 2005. An indicator named citation per publication (CPP) was presented in this study to assess the impact of article output per year, different countries, institutes, and authors from the worldwide. Publication per institute (PPI) in a country was used to be an indicator to compare institute’s research performance by country. Citation analysis was made to select the most frequently cited articles since publication to 2005 of each year. A citation model was applied to describe the relationship between the cumulative number of citations and article life. The results indicate that with the increase article output per year, the CPP decreased slightly since 1997. The USA produced 55% of all pertinent articles. Institutes from the UK had a higher PPI. The most prolific institutes and authors, and the most frequently cited articles per year were all listed. In addition, a citation model was successfully applied to evaluate performance of each year, and the most frequently cited articles of each year were also compared by the model.

Keywords: Analysis, Bibliometrics, Citation, Citations, First, Impact, Indicator, Life, Model, Publication, Research, Research Performance, SCI, SSCI, UK, USA

? Huang, Y. and Zhao, X. (2008), Trends of DDT research during the period of 1991 to 2005. *Scientometrics*, **75** (1), 111-122.

Full Text: [2008\Scientometrics75, 111.pdf](2008/Scientometrics75,%20111.pdf)

Abstract: A keyword analysis was applied in this work to evaluate research trends of DDT (1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane) papers published between 1991 and 2005 in any journal of all the subject categories of the Science Citation Index compiled by ISI (Institute for Scientific Information, Philadelphia, USA). DDT was used as a keyword to search parts of titles, abstracts, or keywords. The published output analysis showed that DDT research steadily increased over the past 15 years and the annual publication output in 2005 was about twice that of 1991. The two peaks in 1997 and 2000 were closely related to two new research fields on DDT, namely the endocrine disruption and the persistent organic pollutants (POPs). A paper entitled ‘Persistent DDT metabolite p,p’-DDE is a potent androgen receptor antagonist’ published in 1995 in Nature by Kelce et al. firstly discovered DDT’s toxicity for humans. As a result, public concerns regarding DDT ballooned and now play a key role in DDT research. Keyword analysis indicated that the research interest changed remarkably from 1991 to 2005. ‘Endocrine disruption’ was one of the most frequently used author keywords in the period between 2002 and 2005 whilst it did not appear before 1997. The new conception of POPs showed the same trend. The whole paper published by India and Mexico ranked at 6(th) and 13(th). That showed that DDT research is often related with DDT’s risk and benifits to humans.

Keywords: Analysis, Humans, India, Institute For Scientific Information, ISI, Journal, Mexico, Papers, Publication, Research, Risk, Risks, Science Citation Index, Toxicity, Trends, USA, Work

? Gupta, B.M. and Dhawan, S.M. (2008), Condensed matter physics: An analysis of India’s research output, 1993-2001. *Scientometrics*, **75** (1), 123-144.

Full Text: [2008\Scientometrics75, 123.pdf](2008/Scientometrics75,%20123.pdf)

Abstract: The study analyses 27018 research papers published by India in condensed matter physics as seen from Science Citation Index-Extended Version (SCIE) (Web of Science) database for the period 1993-1995, 1996-1998 and 1999-2001. The study reports that condensed matter physics is the most sought after branch in physics research in India, accounting for 20% share of the country output in physics. The University & College sector as well as R&D sector are the major contributors to condensed matter physics. However, the country growth in this field, computed on six yearly basis, has still been negative (-1%) compared to 17.4% country growth in overall physics during the same period, 1993-1995 to 1999-2001. The study also maps condensed matter physics research on other dimensions such as institutional productivity, nature of collaboration in research, and institutional specialization. It examines highly cited papers, and lists prominent and productive scientists in this field. It also provides suggestions for accelerating condensed matter research in India.

Keywords: Analysis, Collaboration, Database, Growth, India, Papers, Research, Sector, Web of Science

? Collazo-Reyes, F., Luna-Morales, M.E., Russell, J.M. and Perez-Angon, M.A. (2008), Publication and citation patterns of Latin American & Caribbean journals in the SCI and SSCI from 1995 to 2004. *Scientometrics*, **75** (1), 145-161.

Full Text: [2008\Scientometrics75, 145.pdf](2008/Scientometrics75,%20145.pdf)

Abstract: Impact factors, publication-citation patterns and growth dynamics were analyzed for the Latin America and the Caribbean journals covered by the Science Citation Index (SCI) and Social Science Citation Index from 1995-2003. Two main journal groups were identified: those publishing mainly in English with substantial contributions from outside the region, and those publishing in local languages, principally by the local community and on subjects of local interest. We found little inter-citation among the local papers while the highest number of citations by extra-regional authors was to papers published in English. Quantitative indicators show that LA-C journals are better positioned in the mainstream literature than ever before.

Keywords: Brazil, Citation, Citation Patterns, Citations, Community, Countries, Dynamics, Elementary Particle Physics, Growth, Impact, Indicators, Journal, Journals, Languages, Latin America, Literature, Papers, Performance, Publishing, SCI, Science, Science Citation Index, Scientific Cooperation, Social Science Citation Index, SSCI, Universities

? Molinari, J.F. and Molinari, A. (2008), A new methodology for ranking scientific institutions. *Scientometrics*, **75** (1), 163-174.

Full Text: [2008\Scientometrics75, 163.pdf](2008/Scientometrics75,%20163.pdf)

Abstract: We extend the pioneering work of J. E. Hirsch, the inventor of the h-index, by proposing a simple and seemingly robust approach for comparing the scientific productivity and visibility of institutions. Our main findings are that i) while the h-index is a sensible criterion for comparing scientists within a given field, it does not directly extend to rank institutions of disparate sizes and journals, ii) however, the h-index, which always increases with paper population, has an universal growth rate for large numbers of papers, iii) thus the h-index of a large population of papers can be decomposed into the product of an impact index and a factor depending on the population size, iv) as a complement to the h-index, this new impact index provides an interesting way to compare the scientific production of institutions (universities, laboratories or journals).

Keywords: Growth, Growth Rate, h Index, h-Index, Institutions, Journals, Methodology, Papers, Population, Ranking, Scientific Institutions, Scientific Production, Size, Universities, Work

? Petek, M. (2008), Personal name headings in COBIB: Testing Lotka’s Law. *Scientometrics*, **75** (1), 175-188.

Full Text: [2008\Scientometrics75, 175.pdf](2008/Scientometrics75,%20175.pdf)

Abstract: The purpose of this article is to provide information about author productivity as reflected through the number of occurrences of personal name headings in the Slovenian online catalogue COBIB. Only authors associated with monographs are treated. So, author productivity of monographs that has not been widely researched is empirically examined to determine conformity or nonconformity to Lotka’s law. A random sample of 1.600 Slovenian authors is drawn from the authority file CONOR. Next, the authors are searched in COBIB and each attributed the number of monographs. Using the formula: x(n) y = c, the values of the exponent n and the constant c are computed and the Kolmogorov-Smirnov test is applied. The paper shows that the author productivity distribution predicted by Lotka also holds for the occurrences of personal name headings in COBIB.

Keywords: Author Productivity, Information, Law, Lotka, Random Sample

? Hou, H., Kretschmer, H. and Liu, Z. (2008), The structure of scientific collaboration networks in Scientometrics. *Scientometrics*, **75** (2), 189-202.

Full Text: [2008\Scientometrics75, 189.pdf](2008/Scientometrics75,%20189.pdf)

Abstract: The structure of scientific collaboration networks in scientometrics is investigated at the level of individuals by using bibliographic data of all papers published in the international journal Scientometrics retrieved from the Science Citation Index (SCI) of the years 1978-2004. Combined analysis of social network analysis (SNA), co-occurrence analysis, cluster analysis and frequency analysis of words is explored to reveal: (1) The microstructure of the collaboration network on scientists’ aspects of scientometrics, (2) The major collaborative fields of the whole network and of different collaborative sub-networks, (3) The collaborative center of the collaboration network in scientometrics.

Keywords: Analysis, Cluster, Cluster Analysis, Cocitation, Collaboration, Collaboration Networks, Data, International, Journal, Microstructure, Network, Network Analysis, Networks, Papers, SCI, Science Citation Index, Scientific Collaboration, Scientometrics, Social, Social Network Analysis, Structure, Visibility, Web

Argamon, S., Dodick, J. and Chase, P. (2008), Language use reflects scientific methodology: A corpus-based study of peer-reviewed journal articles. *Scientometrics*, **75** (2), 203-238.

Full Text: [2008\Scientometrics75, 203.pdf](2008/Scientometrics75,%20203.pdf)

Abstract: Recently, philosophers of science have argued that the epistemological requirements of different scientific fields lead necessarily to differences in scientific method. In this paper, we examine possible variation in how language is used in peer-reviewed journal articles from various fields to see if features of such variation may help to elucidate and support claims of methodological variation among the sciences. We hypothesize that significant methodological differences will be reflected in related differences in scientists’ language style. This paper reports a corpus-based study of peer-reviewed articles from twelve separate journals in six fields of experimental and historical sciences. Machine learning methods were applied to compare the discourse styles of articles in different fields, based on easily-extracted linguistic features of the text. Features included function word frequencies, as used often in computational stylistics, as well as lexical features based on systemic functional linguistics, which affords rich resources for comparative textual analysis. We found that indeed the style of writing in the historical sciences is readily distinguishable from that of the experimental sciences. Furthermore, the most significant linguistic features of these distinctive styles are directly related to the methodological differences posited by philosophers of science between historical and experimental sciences, lending empirical weight to their contentions.

Keywords: Analysis, Author, Discourse, Evolution, Experimental, Function, Geology, Historical Science, Journal, Journal Articles, Journals, Lead, Learning, Methodology, Methods, Peer-Reviewed, Science, Sciences, Text Categorization

? Klavans, R. and Boyack, K.W. (2008), Thought leadership: A new indicator for national and institutional comparison. *Scientometrics*, **75** (2), 239-250.

Full Text: [2008\Scientometrics75, 239.pdf](2008/Scientometrics75,%20239.pdf)

Abstract: This paper introduces a new method for evaluating national publication activities. This new indicator, thought leadership, captures whether the nation is a thought leader (building on the more recently cited literature for that field) or follower (building on the older cited literature for that field). Publication data for 2003 are used to illustrate which nations tend to build on the more recent discoveries in chemistry and clinical medicine. Implications for national and laboratory policy are discussed.

Keywords: Chemistry, Clinical, Comparison, Impact, Index, Indicator, Leadership, Literature, Medicine, Nations, Policy, Publication, Science, Technology

? Markpin, T., Boonradsamee, B., Ruksinsut, K., Yochai, W., Premkamolnetr, N., Ratchatahirun, P. and Sombatsompop, N. (2008), Article-count impact factor of materials science journals in SCI database. *Scientometrics*, **75** (2), 251-261.

Full Text: [2008\Scientometrics75, 251.pdf](2008/Scientometrics75,%20251.pdf)

Abstract: This article proposed a new index, so-called ‘Article-Count Impact Factor’ (ACIF) for evaluating journal quality in light of citation behaviour in comparison with the ISI journal impact factors. The ACIF index was the ratio of the number of articles that were cited in the current year to the source items published in that journal during the previous two years. In this work, we used 171 journal titles in materials categories published in the years of 2001-2004 in international journals indexed in the Science Citation Index Expanded (SCI) database as data source. It was found that ACIF index could be used as an alternative tool in assessing the journal quality, particularly in the case where the assessed journals had the same (equal or similar) JIF values. The experimental results suggested that the higher the ACIF value, the more the number of articles being cited. The changes in ACIF values were more dependent on the JIF values rather than the total number of articles. Polymer Science had the greatest ACIF values, suggesting that the articles in Polymer Science had greater ‘citation per article’ than those in Metallurgical Engineering and Ceramics. It was also suggested that in order to increase a JIF value of 1.000, Ceramics category required more articles to be cited as compared to Metallurgical Engineering and Polymer Science categories.

Keywords: Alternative, Behaviour, Changes, Citation, Comparison, Database, Experimental, History, Impact Factor, Impact Factors, International, ISI, Journal, Journal Impact, Journal Impact Factors, Journal Quality, Journals, Quality, SCI, Science, Science Citation Index, Science Journals, Work

Andreis, M. and Jokic, M. (2008), An impact of Croatian journals measured by citation analysis from SCI-expanded database in time span 1975-2001. *Scientometrics*, **75** (2), 263-288.

Full Text: [2008\Scientometrics75, 263.pdf](2008/Scientometrics75,%20263.pdf)

Abstract: The aim of this research is to gain an insight into international recognition of the STM (Science, Technology, and Medicine) Croatian journals measured by citations in SCI-expanded database. The sample for the research was a citation analysis of 142 journals in time span 1975-2001 for papers published in 1975-1998. More than 90% of those journals are not indexed by SCI-expanded. For the purpose of this research we introduced a new scientometric indicator Normalized number of Citations per 100 Papers (NCP) that allows us direct comparison of the journals from various categories (NCP = 100C/P / IF1989). We chose the year 1989 as a mean value for time span 1975-2001. By citation analysis we established the influence of errors on recognition of Croatian journals and their articles. Obtained results show that an article-to-article link is not found for 32% of cited items. The most frequent type of error is journal title, 37%, which indicates that approximately one third of Croatian journals can not be found when searching by journal title only. Some Croatian journals, even not indexed by SCI-expanded, showed relatively high rank in an impact, i.e. their NCP is higher than 100, and number of citations per paper is higher than 1.

Keywords: Academic Journals, Analysis, Citation, Citation Analysis, Citations, Comparison, Database, End, Error, Europe, Indicator, Indicators, Information, International, Journal, Journals, Papers, Research, Science, Scientometric, STM, Visibility, World

? Baldini, N. (2008), Negative effects of university patenting: Myths and grounded evidence. *Scientometrics*, **75** (2), 289-311.

Full Text: [2008\Scientometrics75, 289.pdf](2008/Scientometrics75,%20289.pdf)

Abstract: This paper reviews the literature on the concerns stemming from university patenting and licensing activities. Scholars investigated threats to scientific progress due to increasing disclosure restrictions, changes in the nature of the research (declining patents’ and publications’ quality, skewing research agendas toward commercial priorities, and crowding-out between patents and publications), diverting energies from teaching activity and reducing its quality. A small section explores problems lamented by industry. Each of these issues is presented and discussed, based on 82 papers published from 1980 to 2006. Some suggestions for further research conclude the essay.

Keywords: Academic Research, Bayh-Dole Act, Changes, Disclosure, Evidence, Intellectual Property, Knowledge Transfer, Licensing, Life Sciences, Literature, Nano-Science, Non-Inventing Peers, Papers, Patents, Publications, Quality, Research, Research-and-Development, Restrictions, Scientific Progress, Small, Teaching, Technology-Transfer, United-States, University

? Osca-Lluch, J., Blesa, P., Barrueco, J.M., Velasco, E. and Krichel, T. (2008), Some aspects of citation indexes in Spain: A comparative analysis. *Scientometrics*, **75** (2), 313-318.

Full Text: [2008\Scientometrics75, 313.pdf](2008/Scientometrics75,%20313.pdf)

Abstract: This paper studies the main characteristics of the citation indexes currently developed in Spain. The paper compares the impact factors offered by Spanish citation indexes with the impact factor of Spanish journals also collected by the JCRs of the ISI (SCI and SSCI) over a five-year period (2001-2005). Spanish journals published in English have higher impact factor scores in the JCR databases of the ISI than in Spanish citation indexes.

Keywords: Analysis, Citation, Citation Indexes, Impact Factor, Impact Factor Scores, Impact Factors, ISI, Journals, SCI, Spain, SSCI

? de la Potterie, B.V. and van Zeebroeck, N. (2008), A brief history of space and time: The scope-year index as a patent value indicator based on families and renewals. *Scientometrics*, **75** (2), 319-338.

Full Text: [2008\Scientometrics75, 319.pdf](2008/Scientometrics75,%20319.pdf)

Abstract: The renewal of patents and their geographical scope for protection constitute two essential dimensions in a patent’s life, and probably the most frequently used patent value indicators. The intertwining of these dimensions (the geographical scope of protection may vary over time) makes their analysis complex, as any measure along one dimension requires an arbitrary choice on the second. This paper proposes a new indicator of patent value, the scope-year index, combining the two dimensions. The index is computed for patents filed at the EPO from 1980 to 1996 and validated in its member states. It shows that the average value of patent filings has increased in the early eighties but has constantly decreased from the mid-eighties until the mid nineties, despite the institutional expansion of the EPO. This result sheds a new and worrying light on the worldwide boom in patent filings.

Keywords: Analysis, Citations, Families, History, Indicator, Indicators, Life, Patent, Patents, Protection, Rights

Notes: MModel

? Molinari, A. and Molinari, J.F. (2008), Mathematical aspects of a new criterion for ranking scientific institutions based on the h-index. *Scientometrics*, **75** (2), 339-356.

Full Text: [2008\Scientometrics75, 339.pdf](2008/Scientometrics75,%20339.pdf)

Abstract: We develop and discuss the theoretical basis of a new criterion for ranking scientific institutions. Our novel index, which is related to the h-index, provides a metric which removes the size dependence. We discuss its mathematical properties such as merging rules of two sets of papers and analyze the relations between the underlying rank/citation-frequency law and the h-index. The proposed index should be seen as a complement to the h-index, to compare the scientific production of institutions (universities, laboratories or journals) that could be of disparate sizes.

Keywords: h Index, h-Index, Institutions, Journals, Law, Laws, Merging, Papers, Ranking, Relations, Research Output, Scientific Institutions, Scientific Production, Size, Universities

? Guan, J. and Gao, X. (2008), Comparison and evaluation of Chinese research performance in the field of bioinformatics. *Scientometrics*, **75** (2), 357-379.

Full Text: [2008\Scientometrics75, 357.pdf](2008/Scientometrics75,%20357.pdf)

Abstract: Bioinformatics is an emerging and rapidly evolving discipline. The bioinformatics literature is growing exponentially. This paper aims to provide an integrated bibliometric study of the knowledge base of Chinese research community, based on the bibliometric information in the field of bioinformatics from SCI-Expanded database during the period of 2000-2005. It is found that China is productive in bioinformatics as far as publication activity in international journals is concerned. For comparative purpose, the results are benchmarked against the findings from five other major nations in the field of bioinformatics: USA, UK, Germany, Japan and India. In terms of collaboration profile, the findings imply that the collaborative scope of China has gradually transcended boundaries of organizations, regions and nations as well. Finally, further analyses on the citation share and some surrogate scientometric indicators show that the publications of Chinese authors suffer from a lowest international visibility among the six countries. Strikingly, Japan has achieved most remarkable impact of publication when compared to research effort devoted to bioinformatics amongst the six countries. The policy implication of the findings lies in that Chinese scientific community needs much work on improving the research impact and pays more attention to strengthening the academic linkages between China and worldwide nations, particularly scientifically advanced countries.

Keywords: Analyses, Bibliometric, Bibliometric Indicators, Bibliometric Study, Boundaries, China, Chinese, Citation, Collaboration, Community, Database, Evaluation, Field, Germany, Impact, Index, India, Indicators, Information, International, Japan, Journals, Knowledge, Knowledge Base, Laser Research, Literature, Nations, Needs, Output, Performance, Policy, Publication, Publication Activity, Publications, Purpose, Research, Research Performance, Science, Scientific-Research, Scientometric, Scope, Surrogate, UK, USA, Visibility, Work

? Vanecek, J. (2008), Patenting propensity in the Czech Republic. *Scientometrics*, **75** (2), 381-394.

Full Text: [2008\Scientometrics75, 381.pdf](2008/Scientometrics75,%20381.pdf)

Abstract: We have compared patenting propensity in the Czech Republic with eight EU countries: Germany, Austria, Hungary, Poland, Finland, Belgium, Ireland and Greece. In comparison based on the EPO and USPTO patents listed per million inhabitants, the Czech Republic ranks rather low. The Czech Republic also generated fewer patents per R&D employee than most other countries. The time series data have shown a decrease of number of Czech patents after 1990 with some revival after 1996. As our analysis indicated, the decrease was partially caused by dissolution or transformation of major patent generators, but the most important cause may lie in a little interest of local enterprises.

Keywords: Analysis, Austria, Belgium, Comparison, Dissolution, Enterprises, EU, Finland, Germany, Greece, Hungary, Ireland, Patent, Patents, Transformation

? Ruane, F. and Tol, R.S.J. (2008), Rational (successive) h-indices: An application to economics in the Republic of Ireland. *Scientometrics*, **75** (2), 395-405.

Full Text: [2008\Scientometrics75, 395.pdf](2008/Scientometrics75,%20395.pdf)

Abstract: We rank economics departments in the Republic of Ireland according to the number of publications, number of citations, and successive h-index of research-active staff. We increase the discriminatory power of the h(1)-index by introducing three generalizations, each of which is a rational number. The first (h(1)(+)) measures the excess over the actual h-index, while the other two (h(1)\*, h(1)(Delta)) measures the distance to the next h-index. At the individual level, h\* and h(Delta) coincide while h(+) is undefined.

Keywords: Application, Citations, Economics, First, h Index, h-Index, Ireland, Power, Publications, Rank, Republic of Ireland

? Thelwall, M. and Zuccala, A. (2008), A university-centred European Union link analysis. *Scientometrics*, **75** (3), 407-420.

Full Text: [2008\Scientometrics75, 407.pdf](2008/Scientometrics75,%20407.pdf)

Abstract: University web sites play an important role in facilitating a wide range of types of communication. This paper reports an analysis of international academic linking in Europe, with particular reference to European Union (EU) integration. The Microsoft search service was used to calculate international interlinking to universities and from universities. Four different web topologies were found for the link structure data and poorly connected countries were identified. The results show the expected EU dominance of the large richer Western European nations, particularly the UK and Germany. The new EU countries are not yet integrated into the EU web but some show strong regional connections.

Keywords: Analysis, Collaboration, Communication, EU, Europe, European Union, Germany, Impact, Integration, International, Nations, Patterns, Structure, UK, Universities, Web, Web Site Interlinking

? Tsay, M.Y. (2008), A bibliometric analysis of hydrogen energy literature, 1965-2005. *Scientometrics*, **75** (3), 421-438.

Full Text: [2008\Scientometrics75, 421.pdf](2008/Scientometrics75,%20421.pdf)

Abstract: The present study explores the characteristics of hydrogen energy literature from 1965 to 2005 based on the database of Science Citation Index Expanded (SCIE) and its implication using the bibliometric techniques. The results of this work reveal that the literature on hydrogen energy grows exponentially with all annual growth rate of about 18% for the last decade. Most of document type is in the form of journal articles or meeting abstracts, constituting 90.17% of the total literature and English is the predominant language (94.66%). USA, Japan and China are the three biggest contributing countries on hydrogen energy literature publishing, 25.8%, 14.9%, 7.7%, respectively. The Chinese Academy of Sciences in China is the largest contributor publishing 308 papers. The journal literature on hydrogen energy does not confirm the typical S-shape for the Bradford-Zipf plot, but five core journals, i.e. International Journal of hydrogen Energy, Journal of Power Source, Journal of the Electrochemical Society, Solid State Ionics, and Electrochimica Act, contributing about 41% can be identified. Journals with highly cited articles and most highly cited articles are also identified, in which the most highly cited article receives more than 1,000 citations.

Keywords: Act, Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Techniques, Characteristics, China, Chinese, Citations, Collaboration, Database, Energy, Growth, Growth Rate, Hydrogen, Interdisciplinarity, Japan, Journal, Journal Articles, Journals, Literature, Nanoscience, Nanotechnology, Papers, Patterns, Publishing, Science Citation Index, Techniques, USA, Work

? Park, H.W. and Leydesdorff, L. (2008), Korean journals in the Science Citation Index: What do they reveal about the intellectual structure of S & T in Korea? *Scientometrics*, **75** (3), 439-462.

Full Text: [2008\Scientometrics75, 439.pdf](2008/Scientometrics75,%20439.pdf)

Abstract: During the last decade, we have witnessed a sustained growth of South Korea’s research output in terms of the world share of publications in the Science Citation Index database. However, Korea’s citation performance is not yet as competitive as publication performance. In this study, the authors examine the intellectual structure of Korean S&T field based on social network analysis of journal-journal citation data using the ten Korean SCI journals as seed journals. The results reveal that Korean SCI journals function more like publication places, neither research channels nor information sources among national scientists. Thus, these journals may provide Korean scholars with access to international scientific communities by facilitating the respective entry barriers. However, there are no citation relations based on their Korean background. Furthermore, we intend to draw some policy implications which may be helpful to increase Korea’s research potential.

Keywords: Access, Analysis, China, Citation, Database, Function, Growth, Information, Intellectual Structure, International, Journals, Korea, Network, Network Analysis, Policy, Potential, Publication, Publications, Relations, Research, SCI, Science Citation Index, Social Network Analysis, Structure, Terms

? Lee, Y.G. (2008), Patent licensability and life: A study of US patents registered by South Korean public research institutes. *Scientometrics*, **75** (3), 463-471.

Full Text: [2008\Scientometrics75, 463.pdf](2008/Scientometrics75,%20463.pdf)

Abstract: The quality and value of a patent can be represented by several proxies, such as how often the patent is cited in other patents, whether it is licensed, and the age of the patent. The paper uses a binary choice model to investigate factors affecting patent licensing, and it uses double-bounded tobit and duration models to investigate factors affecting patent life. Explanatory variables and dependent variables are extracted from U.S. patent information and related data. Findings suggest research collaboration has a positive effect on both patent licensing and patent life. Other characteristics such as invention size, namely, the scope of the invention measured by number of claims, and organizational technological cumulativeness, measured by self-citation counts, also affect patent life.

Keywords: Collaboration, Information, Licensing, Life, Model, Models, Patent, Patents, Quality, Research, Research Collaboration, Self-Citation, Size, US

? Curras, E. and Barreiro, E.W. (2008), Integration in Europe of human genetics results obtained by Spaniards in the USA: A historical perspective. *Scientometrics*, **75** (3), 473-493.

Full Text: [2008\Scientometrics75, 473.pdf](2008/Scientometrics75,%20473.pdf)

Abstract: The mobility of Spanish biochemists from Europe to the United States over the past 80 years (1927-2006) is approached from a historical perspective. The academic community on human genetics has awarded this emigrated Spanish community with the Nobel prize as well as other awards from European foundations. The vertical/horizontal integration methodology offers an opportunity to understand the extremely satisfactory history of a small European community overseas. To piece the puzzle together, continuous reference is made to the theory of systems. To test and use this holistic history, the circulation of the knowledge produced on cancer has been studied as intrinsically related to time by using the algorithmic historiography. Francisco Duran Reynals and Severe, Ochoa have been selected as examples of the vertical integration. The former one because he was the director of an important collaborator, his own wife, the latter, as the founder of a Spanish specific research school in America based in his own work. The simultaneous stay of several young Spanish scientists at the Columbia University (Mariano Barbacid, Manuel Perucho and Angel Pellicer) serves to design the horizontal integration, to create a holon hierarchy to reflect the criteria of subsidiarity and acceptability, and to focus on the Spanish discoveries and contributions to cancer research. The transatlantic flows of knowledge generated by the Spanish elite of biochemists in the USA from 1927 on define a network of geographical displacements. As a result, the social structure thus visualizes the identity of the international mobility of scientists who leave for Europe/USA, and their return to Spain. A model of the brain drain of professionals to the USA, that retain 80% of the Spanish cancer researchers, is developed.

Keywords: Biochemistry, Biology, Brain, Brain-Drain, Cancer, Cancer Research, Community, Criteria, Europe, Genes, Genetics, History, Human, Information, Integration, International, Knowledge, Methodology, Mobility, Model, Network, Origin, Research, Small, Spain, Structure, Theory, United States, USA, Work

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Full Text: [2008\Scientometrics75, 495.pdf](2008/Scientometrics75,%20495.pdf)

Abstract: We analyze the temporal evolution of emerging fields within several scientific disciplines in terms of numbers of authors and publications. From bibliographic searches we construct databases of authors, papers, and their dates of publication. We show that the temporal development of each field, while different in detail, is well described by population contagion models, suitably adapted from epidemiology to reflect the dynamics of scientific interaction. Dynamical parameters are estimated and discussed to reflect fundamental characteristics of the field, such as time of apprenticeship and recruitment rate. We also show that fields tire characterized by simple scaling laws relating numbers of new publications to new authors, with exponents that reflect increasing or decreasing returns in scientific productivity.

Keywords: Computers, Cosmology, Development, Dynamics, Epidemiology, Evolution, Flatness, Growth, Horizon, Ideas, Inflationary Universe, Interaction, Laws, Mathematical Approach, Modeling, Models, Papers, Population, Publication, Publications, Scaling, Spread

? He, Y. and Guan, J.C. (2008), Contribution of Chinese publications in computer science: A case study on LNCS. *Scientometrics*, **75** (3), 519-534.

Full Text: [2008\Scientometrics75, 519.pdf](2008/Scientometrics75,%20519.pdf)

Abstract: Conference proceedings are one of the key communication channels in computer science. This paper aims to analyze the Chinese outputs in the context of conference papers in computer science through an exploration of the conference proceedings series book - Lecture Notes in Computer Science (LNCS) in the period of 1997-2005. Results indicate that: 1. The number of Chinese papers in LNCS keeps growing in the studied period, the share of Chinese papers in LNCS in recent years is much higher than that of Chinese SCI papers in the world, In sharp contrast with remarkable growth of the share of Chinese papers in LNCS, the share of SCI articles in top journals of computer science published by the scientists of mainland China is negligible during the same period. 2. Chinese researchers are more likely to collaborate with domestic fellows, 3. In spite of the increasing amounts of Chinese papers in LNCS, they receive only a few citations, 4. The articles are strikingly more cited by authors themselves and international authors’ citations are more than Chinese authors’ non-self-citations in the first three years after publication, 5. Based on the new indicator Impact Index (II) the authors proposed, the relative impact of Chinese articles in LNCS is increasing although the average impact of Chinese papers in LNCS is obviously less than that of the publications in LNCS in each year during the studied period.

Keywords: Case Study, China, Chinese, Citation Analysis, Citations, Co-Citation, Communication, First, Growth, Indicator, Information, International, Journals, Knowledge Production, Papers, Publication, Publications, Research Performance, SCI, Science, Structural Aspects, Word Analysis

? Kim, H. and Park, Y. (2008), The impact of R&D collaboration on innovative performance in Korea: A Bayesian network approach. *Scientometrics*, **75** (3), 535-554.

Full Text: [2008\Scientometrics75, 535.pdf](2008/Scientometrics75,%20535.pdf)

Abstract: It is well known from previous research activities that R&D collaboration among economic actors for knowledge production is very important. An accompanying analysis of the impact of R&D collaboration on innovative performance has to be conducted for transferring knowledge to the globalized knowledge-based economy. When we first investigated previous research concerning R&D collaboration, we found some limitations in the analysis methodology. In order to overcome these limitations in previous research, we applied a Bayesian network for analyzing the impact of R&D collaboration in Korean firms on their innovative performance.

Keywords: Analysis, Biotechnology, Collaboration, Expert-Systems, Firms, First, Graphical Structures, Industry, Interfirm Cooperation, Inventors, Knowledge, Korea, Methodology, National Systems, Network, Probabilities, Research, Taiwan

? Mattsson, P., Laget, P., Nilsson, A. and Sundberg, C.J. (2008), Intra-EU vs. extra-EU scientific co-publication patterns in EU. *Scientometrics*, **75** (3), 555-574.

Full Text: [2008\Scientometrics75, 555.pdf](2008/Scientometrics75,%20555.pdf)

Abstract: The increase of co-authored papers is a recognized fact. At the same time the factors influencing this change is not well known. This article aims at studying the patterns of EU science co-authorships. We analyzed articles published in 18 EU countries and their intra-EU (within EU) and extra-EU (with partners outside EU) co-publication pattern in five scientific fields. The results point to a Europeanisation of shared co-authorship rather than an internationalization outside Europe. Smaller countries co-authored more with other EU countries than bigger countries while the co-authorship rate with extra-EU partners was not dependent of the country’s size. The co-authorship patterns were also found to depend on the scientific field. Engineering and Computing & Technology was the field with the highest level of national publications and Physical, Chemical & Earth Sciences the field with the highest level of both intra-EU and extra-EU collaborations. These results support the view that a single market for research is developing within the EU with a seamless extension of national systems into other Member States ones.

Keywords: Co-Authorship, Coauthorship, Cooperation, EU, Europe, Impact, Internationalization, Market, Multiple Authorship, Papers, Publications, Research, Research Collaboration, Science, Size, Universities

? Rousseau, R. and Zhang, L. (2008), Betweenness centrality and Q-measures in directed valued networks. *Scientometrics*, **75** (3), 575-590.

Full Text: [2008\Scientometrics75, 575.pdf](2008/Scientometrics75,%20575.pdf)

Abstract: Q-measures express the bridging function of nodes in a network subdivided into two groups. An approach to Q-measures in the context of weighted or valued directed networks is proposed. This new approach uses flow centrality as the main concept. Simple examples illustrate the definition.

Keywords: Function, Network

? Bar-Ilan, J. (2008), The h-index of h-index and of other informetric topics. *Scientometrics*, **75** (3), 591-605.

Full Text: [2008\Scientometrics75, 591.pdf](2008/Scientometrics75,%20591.pdf)

Abstract: In this paper we examine the applicability of the concept of h-index to topics, where a topic has index h, if there are h publications that received at least h citations and the rest of the publications on the topic received at most h citations. We discuss methodological issues related to the computation of h-index of topics (denoted h-b index by BANKS [2006]). Data collection for computing the h-b index is much more complex than computing the index for authors, research groups and/or journals, and has several limitations. We demonstrate the methods on a number of informetric topics, among them the h-index.

Keywords: Banks, Citation Counts, Citations, Collection, Google-Scholar, h Index, h-Index, Hirsch-Index, Impact, Index h, Journals, Methods, Publications, Ranking, Research, Science, Scientists, Scopus, Web

? Janssens, F., Glänzel, W. and De Moor, B. (2008), A hybrid mapping of information science. *Scientometrics*, **75** (3), 607-631.

Full Text: [2008\Scientometrics75, 607.pdf](2008/Scientometrics75,%20607.pdf)

Abstract: Previous studies have shown that hybrid clustering methods that incorporate textual content and bibliometric information can outperform clustering methods that use only one of these components. In this paper we apply a hybrid clustering method based on Fisher’s inverse chi-square to integrate full-text with citations and to provide a mapping of the field of information science. We quantitatively and qualitatively asses the added value of such an integrated analysis and we investigate whether the clustering outcome is a better representation of the field by comparing with a text-only clustering and with another hybrid method based on linear combination of distance matrices. Our data set consists of almost 1000 articles and notes published in the period 2002-2004 in 5 representative journals. The optimal number of clusters for the field is 5, determined by using a combination of distance-based and stability-based methods. Term networks present the cognitive structure of the field and are complemented by the most representative publications. Three large traditional sub-disciplines, particularly, information retrieval, bibliometrics/scientometrics, and more social aspects, and two smaller clusters about patent analysis and webometrics, can be distinguished.

Keywords: Analysis, Bibliometric, Chi-Square, Citations, Clustering, Data, Field, Information, Information Retrieval, Information Science, Journals, Mapping, Methods, Networks, Outcome, Patent, Patent Analysis, Publications, Representation, Science, Scientific Papers, Social, Structure, Value, Visualization, Web, Webometrics

? Krampen, G. (2008), The evaluation of university departments and their scientists: Some general considerations with reference to exemplary bibliometric publication and citation analyses for a Department of Psychology. *Scientometrics*, **76** (1), 3-21.

Full Text: [2008\Scientometrics76, 3.pdf](2008/Scientometrics76,%203.pdf)

Abstract: In reference to an exemplary bibliometric publication and citation analysis for a University Department of Psychology, some general conceptual and methodological considerations on the evaluation of university departments and their scientists are presented. Data refer to publication and citation-by-others analyses (PsycINFO, PSYNDEX, SSCI, and SCI) for 36 professorial and non-professorial scientists from the tenure staff of the department under study, as well as confidential interviews on self-and colleagues-perceptions with seven of the sample under study. The results point at (1) skewed (Pareto-) distributions of all bibliometric variables demanding nonparametrical statistical analyses, (2) three personally identical outliers which must be excluded from some statistical analyses, (3) rather low rank-order correlations of publication and citation frequencies having approximately 15% common variance, (4) only weak interdependences of bibliometric variables with age, occupational experience, gender, academic status, and engagement in basic versus applied research, (5) the empirical appropriateness and utility of a normative typological model for the evaluation of scientists’ research productivity and impact, which is based on cross-classifications with reference to the number of publications and the frequency of citations by other authors, and (6) low interrater reliabilities and validity of ad hoc evaluations within the departments’ staff. Conclusions refer to the utility of bibliometric data for external peer reviewing and for feedback within scientific departments, in order to make colleague-perceptions more reliable and valid.

Keywords: Age, Analyses, Analysis, Bibliometric, Citation, Citation Analysis, Citations, Confidential, Correlations, Data, Engagement, Evaluation, Experience, Gender, General, Impact, Interviews, Journals, Model, Occupational, Outliers, Pareto, Productivity, Psycinfo, Publication, Publications, Research, Research Productivity, SCI, SSCI, Stands Today, Statistical Analyses, Tenure, University, Utility, Validity, Variance

? Eto, H. (2008), Scientometric definition of science: In what respect is the humanities more scientific than mathematical and social sciences? *Scientometrics*, **76** (1), 23-42.

Full Text: [2008\Scientometrics76, 23.pdf](2008/Scientometrics76,%2023.pdf)

Abstract: “What is science” is not only intellectually interesting but also politically crucial in the proper allocation of budget. As science does not define itself and only philosophy defines everything including science, this paper first sketches the philosophical view of science. Then, hypotheses are presented as to what definition is actually given for science by scientific circles themselves. The hypotheses are tested in a scientometric way by observing the trend in the magazine Science. Unexpected results are obtained. The actual trend in Science does not reflect what has long been considered about science. Specifically, chemistry is at the top in the number of papers, far above physics. More papers are in historical sciences (part of the humanities) than in mathematics, computer science and social science. It is discussed in what respect chemistry is the most scientific, and the humanities is more scientific than the abovementioned three scientific fields. It is interpreted that, out of the two aspects in Galilei’s view of science (metodo compositivo and metodo risolutivo.), the latter (empirical solution of problems by using technical instruments) dominates the former (systematic theory using mathematics) in Science.

Keywords: Articles, Authorship, Budget, Chemistry, Citation Patterns, First, Humanities, Journals, Operational-Research, Papers, Philosophy, Physics, Science, Sciences, Scientometric, Social Sciences, Solution, Technology, Theory

? Kostoff, R.N., Barth, R.B. and Lau, C.G.Y. (2008), Relation of seminal nanotechnology document production to total nanotechnology document production - South Korea. *Scientometrics*, **76** (1), 43-67.

Full Text: [2008\Scientometrics76, 43.pdf](2008/Scientometrics76,%2043.pdf)

Abstract: This study evaluates trends in quality of nanotechnology and nanoscience papers produced by South Korean authors. The metric used to gauge quality is ratio of highly cited nanotechnology papers to total nanotechnology papers produced in sequential time frames. In the first part of this paper, citations (and publications) for nanotechnology documents published by major producing nations and major producing global institutions in four uneven time frames are examined. All nanotechnology documents in the Science Citation Index [SCI, 2006] for 1998, 1999-2000, 2001-2002, 2003 were retrieved and analyzed in March 2007. In the second part of this paper, all the nanotechnology documents produced by South Korean institutions were retrieved and examined. All nanotechnology documents produced in South Korea (each document had at least one author with a South Korea address) in each of the above time frames were retrieved and analyzed. The South Korean institutions were extracted, and their fraction of total highly cited documents was compared to their fraction of total published documents. Non-Korean institutions that co-authored papers were included as well, to offer some perspective on the value of collaboration.

Keywords: Citations, Collaboration, First, Institutions, Korea, Nanoscience, Nanotechnology, Nations, Papers, Publications, Quality, Science Citation Index, Trends

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Full Text: [2008\Scientometrics76, 69.pdf](2008/Scientometrics76,%2069.pdf)

Abstract: Open Access movement has been proven to be capable to enhance the recognition of scientific outputs by improving their visibility. However, it is not clear how different entities benefit from the Open Access advantage, because, the recognition process is dominated by some psychological or realistic biases, resulting in an unequal distribution of citations between different entities. The biases may be exacerbated in Open Access world, e.g. due to the scientists uncertainty about the quality of Open Access materials, or quantitatively or qualitatively unequal presence of countries. Consequently, although, Open Access is able to achieve their potential citations, it is not unlikely that it increases the inequalities, depriving the already “have-nots”. Trying to illuminate how countries are benefiting from Open Access advantage, this study compares citation performances of the world’s countries in two journal sets, i.e. Open Access and non Open Access journals. The results of the analyses conducted at subject field level show that overall recognition gap between developed and less-developed blocks is widened by publishing in Open Access journals. The verification of individual countries’ performances confirms the finding by revealing that open-access-advantaged nations are mainly consisted of developed ones. However, some open-access-advantaged instances are from the less-developed block, which may promisingly suggest early heralds of Open Access potentialities to achieve the recognition of “lost sciences”, leading to relative reparation of the gap in future.

Keywords: Advantage, Articles, Citation, Citations, Impact, Journal, Journals, Nations, Performance, Potential, Publishing, Quality, Science, System, Uncertainty

? Kao, C., Lin, H.W., Chung, S.L., Tsai, W.C., Chiou, J.S., Chen, Y.L., Chen, L.H., Fang, S.C. and Paoh, H.L. (2008), Ranking taiwanese management journals: A case study. *Scientometrics*, **76** (1), 95-115.

Full Text: [2008\Scientometrics76, 95.pdf](2008/Scientometrics76,%2095.pdf)

Abstract: To improve the quality of journals in Taiwan, the National Science Council (NSC) of the Republic of China evaluates journals in the fields of humanities and social sciences periodically. This paper describes the evaluation of 46 management journals conducted by the authors, as authorized by the NSC. Both a subjective approach, with judgments solicited from 345 experts, and an objective approach, with data collected on four indicators: journal cross citation, dissertation citation, authors’ scholastic reputation, and author diversity, were used to make a comprehensive evaluation. Performance in the four indicators were aggregated using weights which were most favourable to all journals, in a compromise sense, to produce the composite indices. The subjective evaluation reflects the general image, or reputation, of journals while the objective evaluation discloses blind spots which have been overlooked by experts. The results show that using either approach alone would have produced results which are misleading, which suggests that both approaches should be used. All of the editors of the journals being evaluated agreed that the evaluation was appropriate and the results are reasonable.

Keywords: Case Study, China, Citation, Composite, Evaluation, Frequency, Humanities, Impact, Indicators, Journal, Journals, Management, Quality, Sciences, Social Sciences, Weights

? Egghe, L. (2008), The mathematical relation between the impact factor and the uncitedness factor. *Scientometrics*, **76** (1), 117-123.

Full Text: [2008\Scientometrics76, 117.pdf](2008/Scientometrics76,%20117.pdf)

Abstract: In a general framework, given a set of articles and their received citations (time periods of publication or citation are not important here) one can define the impact factor (IF) as the total number of received citations divided by the total number of publications (articles). The uncitedness factor (UF) is defined as the fraction of the articles that received no citations. It is intuitively clear that IF should be a decreasing function of UF. This is confirmed by the results in [VAN LEEUWEN & MOED, 2005] but all the given examples show a typical shape, seldom seen in informetrics: a horizontal S-shape (first convex then concave). Adopting a simple model for the publication-citation relation, we prove this horizontal S-shape in this paper, showing that such a general functional relationship can be generally explained.

Keywords: Citation, Citations, First, Framework, Function, Impact Factor, Informetrics, Model, Publication, Publications

? Moghaddam, G.G. and Moballeghi, M. (2008), How do we measure the use of scientific journals? A note on research methodologies. *Scientometrics*, **76** (1), 125-133.

Full Text: [2008\Scientometrics76, 125.pdf](2008/Scientometrics76,%20125.pdf)

Abstract: Scientific journals represent a significant and growing part of the libraries and many researchers have attempted to measure their use by various methodological approaches till date. In this paper, the author reviews the methodologies employed by researchers working on scientific journals usage. It aims to present an overall picture of the research methods used in the area, in a way that will be of value to anyone seeking to study scientific journals. The author reviews four main research methodologies which are being used for profiling scientific journals usage including questionnaire, interview, citation analysis and transaction log analysis.

Keywords: Analysis, Citation, Citation Analysis, Impact Factors, Journals, Logs, Methods, Questionnaire, Research, Scientific Journals

? Fiala, D., Rousselot, F. and Jezek, K. (2008), PageRank for bibliographic networks. *Scientometrics*, **76** (1), 135-158.

Full Text: [2008\Scientometrics76, 135.pdf](2008/Scientometrics76,%20135.pdf)

Abstract: In this paper, we present several modifications of the classical PageRank formula adapted for bibliographic networks. Our versions of PageRank take into account not only the citation but also the co-authorship graph. We verify the viability of our algorithms by applying them to the data from the DBLP digital library and by comparing the resulting ranks of the winners of the ACM E. F. Codd Innovations Award. Rankings based on both the citation and co-authorship information turn out to be “better” than the standard PageRank ranking.

Keywords: Citation, Co-Authorship, Coauthorship, Graph, Information, Publications, Ranking, Standard

? Leydesdorff, L. (2008), The delineation of nanoscience and nanotechnology in terms of journals and patents: A most recent update. *Scientometrics*, **76** (1), 159-167.

Full Text: [2008\Scientometrics76, 159.pdf](2008/Scientometrics76,%20159.pdf)

Abstract: The journal set which provides a representation of nanoscience and nanotechnology at the interfaces among applied physics, chemistry, and the life sciences is developing rapidly because of the introduction of new journals. The relevant contributions of nations can be expected to change according to the representations of the relevant interfaces among journal sets. In the 2005 set the position of the USA decreased more than in the 2004-set, while the EU-27 gained in terms of its percentage of world share of citations. The tag “Y01N” which was newly added to the EU classification system for patents, allows for the visualization of national profiles of nanotechnology in terms of relevant patents and patent classes.

Keywords: Chemistry, China, Citations, Classification, EU, Interfaces, Journal, Journals, Life, Life Sciences, Nanoscience, Nanoscience and Nanotechnology, Nanotechnology, Nations, Patent, Patents, Representation, Science, Sciences, USA, Visualization

? Haslam, N., Ban, L., Kaufmann, L., Loughnan, S., Peters, K., Whelan, J. and Wilson, S. (2008), What makes an article influential? Predicting impact in social and personality psychology. *Scientometrics*, **76** (1), 169-185.

Full Text: [2008\Scientometrics76, 169.pdf](2008/Scientometrics76,%20169.pdf)

Abstract: Factors contributing to citation impact in social-personality psychology were examined in a bibliometric study of articles published in the field’s three major journals. Impact was operationalized as citations accrued over 10 years by 308 articles published in 1996, and predictors were assessed using multiple databases and trained coders. Predictors included author characteristics (i.e., number, gender, nationality, eminence), institutional factors (i.e., university prestige, journal prestige, grant support), features of article organization (i.e., title characteristics, number of studies, figures and tables, number and recency of references), and research approach (i.e., topic area, methodology). Multivariate analyses demonstrated several strong predictors of impact, including first author eminence, having a more senior later author, journal prestige, article length, and number and recency of references. Many other variables - e.g., author gender and nationality, collaboration, university prestige, grant support, title catchiness, number of studies, experimental vs. correlational methodology, topic area - did not predict impact.

Keywords: Analyses, Approach, Bibliometric, Bibliometric Study, Characteristics, Citation, Citations, Collaboration, Databases, Disciplines, Experimental, First, Gender, Impact, Information-Science, Institutional Factors, Journal, Journals, Length, Manuscript, Methodology, Model, Organization, Personality, Personality Psychology, Predictors, Psychology, Quality, Reliability, Research, Social, Support, University

? Schreiber, M. (2008), The influence of self-citation corrections on Egghe’s g index. *Scientometrics*, **76** (1), 187-200.

Full Text: [2008\Scientometrics76, 187.pdf](2008/Scientometrics76,%20187.pdf)

Abstract: The g index was introduced by Leo Egghe as an improvement of Hirsch’s index h for measuring the overall citation record of a set of articles. It better takes into account the highly skewed frequency distribution of citations than the h index. I propose to sharpen this g index by excluding the self-citations. I have worked out nine practical cases in physics and compare the h and g values with and without self-citations. As expected, the g index characterizes the data set better than the h index. The influence of the self-citations appears to be more significant for the g index than for the h index.

Keywords: Citation, Citation Record, Citations, g Index, g-Index, h Index, h-Index, Index h, Record, Researchers, Self-Citation, Self-Citations

? Lombardo, L. (2008), New indicators linking patenting and business R&D expenditure. *Scientometrics*, **76** (2), 201-224.

Full Text: [2008\Scientometrics76, 201.pdf](2008/Scientometrics76,%20201.pdf)

Abstract: The paper presents a new national level indicator based on shares of OECD aggregate ‘external’ patent applications world-wide. It provides the first reliable trend data for patent applications since new patent application procedures were introduced in the 1980s. The trends show a strong correlation with business R&D expenditure (BERD) trend data similarly based on shares of OECD aggregate BERD, reaffirming a relationship observed in previous studies using granted patents. However the reliability of the current indicator over an extended 20 year period shows that in two cases, the US and UK, there is divergence in correlation over part of the period studied. This aspect of the study provides evidence that the surge in external patenting in the US, over the period 1989 to 1996, is not driven by BERD and strongly suggests public sector research as a driver. This result shows that the new patent applications indicator can monitor factors in national systems not easily observed by other means. In this case it shows potential for monitoring the success of policies in driving public sector research towards commercial outcomes.

Keywords: Business, Driving, Evidence, First, Indicator, Indicators, Outcomes, Patent, Patents, Potential, Procedures, Public Sector, Reliability, Research, Sector, Statistics, Trends, UK, US

Abramo, G., D’Angelo, C.A. and Pugini, F. (2008), The measurement of Italian universities’ research productivity by a non parametric-bibliometric methodology. *Scientometrics*, **76** (2), 225-244.

Full Text: [2008\Scientometrics76, 225.pdf](2008/Scientometrics76,%20225.pdf)

Abstract: This paper presents a methodology for measuring the technical efficiency of research activities. It is based on the application of data envelopment analysis to bibliometric data on the Italian university system. For that purpose, different input values (research personnel by level and extra funding) and output values (quantity, quality and level of contribution to actual scientific publications) are considered. Our study aims at overcoming some of the limitations connected to the methodologies that have so far been proposed in the literature, in particular by surveying the scientific production of universities by authors’ name.

Keywords: Analysis, Application, Bibliometric, Citation, Data, Data Envelopment, Data Envelopment Analysis, Efficiency, Funding, Impact, Indicators, Literature, Measurement, Methodologies, Methodology, Personnel, Productivity, Publications, Purpose, Quality, Research, Research Productivity, Scientific Production, Scientific Publications, Scientists, Universities, University

? Ma, R.M., Ni, C.Q. and Qiu, J.P. (2008), Scientific research competitiveness of world universities in computer science. *Scientometrics*, **76** (2), 245-260.

Full Text: [2008\Scientometrics76, 245.pdf](2008/Scientometrics76,%20245.pdf)

Abstract: This article evaluates the scientific research competitiveness of world universities in computer science. The data source is the Essential Science Indicator (ESI) database with a time span of more than 10 years, from 01/01/1996 to 08/31/2006. We establish a hierarchical indicator system including four primary indicators which consist of scientific research production, influence, innovation and development and six secondary indicators which consist of the number of papers, total citations, highly cited papers, hot papers, average citations per paper and the ration of highly cited papers to papers. Then we assign them with proper weights. Based on these, we obtain the rankings of university and country/territory competitiveness in computer science. We hope this paper can contribute to the further study in the evaluation of a certain subject or a whole university.

Keywords: Bibliometric Methods, Citations, Data, Database, Development, Evaluation, Indicator, Indicators, Innovation, Papers, Primary, Rankings, Research, Research Performance, Science, Scientific Research, Source, Universities, University, World

? Sambunjak, D., Ivanis, A., Marusic, A. and Marusic, M. (2008), Representation of journals from five neighboring European countries in the Journal Citation Reports. *Scientometrics*, **76** (2), 261-271.

Full Text: [2008\Scientometrics76, 261.pdf](2008/Scientometrics76,%20261.pdf)

Abstract: This study explores the representation of scientific journals from Italy, Hungary, Slovenia, Croatia, and Serbia and Montenegro in the Thomson Scientific’s 2005 Journal Citation Reports (JCR). The number of journals covered by JCR was analyzed in relation to scientific productivity of selected countries and the size of their economies, and no apparent relationship between these factors was found. Our findings suggest that other factors, including the quality of individual journals, may influence how many journals a country will have in the JCR.

Keywords: Croatia, Database, Hungary, Impact Factor, Italy, Journal Citation Reports, Journals, Language, Quality, Representation, Scientific Journals, Size, Visibility, War

Ahlgren, P. and Jarneving, B. (2008), Bibliographic coupling, common abstract stems and clustering: A comparison of two document-document similarity approaches in the context of science mapping. *Scientometrics*, **76** (2), 273-290.

Full Text: [2008\Scientometrics76, 273.pdf](2008/Scientometrics76,%20273.pdf)

Abstract: This paper deals with two document-document similarity approaches in the context of science mapping: bibliographic coupling and a text approach based on the number of common abstract stems. We used 43 articles, published in the journal Information Retrieval, as test articles. An information retrieval expert performed a classification of these articles. We used the cosine measure for normalization, and the complete linkage method was used for clustering the articles. A number of articles pairs were ranked (1) according to descending normalized coupling strength, and (2) according to descending normalized frequency of common abstract stems. The degree of agreement between the two obtained rankings was low, as measured by Kendall’s tau. The agreement between the two cluster solutions, one for each approach, was fairly low, according to the adjusted Rand index. However, there were examples of perfect agreement between the coupling solution and the stems solution. The classification generated by the expert contained larger groups compared to the coupling and stems solutions, and the agreement between the two solutions and the classification was not high. According to the adjusted Rand index, though, the stems solution was a better approximation of the classification than the coupling solution. With respect to cluster quality, the overall Silhouette value was slightly higher for the stems solution. Examples of homogeneous cluster structures, as well as negative Silhouette values, were found with regard to both solutions. The expert classification indicates that the field of information retrieval, as represented by one volume of articles published in Information Retrieval, is fairly heterogeneous regarding research themes, since the classification is associated with 15 themes. The complete linkage method, in combination with the upper tail rule, gave rise to a fairly good approximation of the classification with respect to the number of identified groups, especially in case of the stems approach.

Keywords: Bibliographic Coupling, Classification, Clustering, Comparison, Information, Information Retrieval, Journal, Linkage, Normalization, Quality, Rankings, Research, Science, Science Mapping, Similarity, Solution

? Navarro, A. and Martin, M. (2008), Scientific production and collaboration in Epidemiology and Public Health, 1997-2002. *Scientometrics*, **76** (2), 291-313.

Full Text: [2008\Scientometrics76, 291.pdf](2008/Scientometrics76,%20291.pdf)

Abstract: This study aims to describe international scientific production and collaboration in Epidemiology and Public Health. It is a bibliometric analysis of articles published during 1997-2002 in 39 international journals. The United States has the greatest production in absolute terms, participating in 46% of the articles studied. Next come Great Britain (13.3%), and Canada (6.8%). In 34.8% of the articles involved participation by at least one of the 15 European Union countries. After adjustment for population and GDP, the Scandinavian countries, The Netherlands, and Australia holding the leading positions. In terms of collaboration, groups of countries with similar profiles are observed.

Keywords: Analysis, Australia, Bibliometric, Bibliometric Analysis, Britain, Canada, Collaboration, European Union, International, International Collaboration, Journals, Participation, Population, Profiles, Science, Scientific Production, The Netherlands, United States

? Yan, E. and Zhu, Q.H. (2008), Hyperlink analysis for government websites of Chinese provincial capitals. *Scientometrics*, **76** (2), 315-326.

Full Text: [2008\Scientometrics76, 315.pdf](2008/Scientometrics76,%20315.pdf)

Abstract: With the data retrieved from the search engines of Yahoo and SOGOU, this article aims to study the total backlink counts, external backlink counts and the Web Impact Factors for government websites of Chinese provincial capitals. By studying whether the backlink counts and WIFs of websites associate with the comprehensive ratings for these websites, the article demonstrates that the backlink counts can be a better evaluation measure for government websites than WIFs. At length, this article also discusses the correlation between backlink counts and economic capacity, and illustrates that backlink counts can also be an indicator for economic status.

Keywords: Analysis, Capacity, Chinese, Citations, Counts, Evaluation, Indicator, Information, Links, Sites, University, Web Impact Factors

? Qiu, J.P., Li, Y.J., Li, J. and Ren, Q. (2008), An exploratory study on substantive co-link analysis: A modification to total co-link analysis. *Scientometrics*, **76** (2), 327-341.

Full Text: [2008\Scientometrics76, 327.pdf](2008/Scientometrics76,%20327.pdf)

Abstract: Since the term “co-link” was put forward, many scholars have done exploratory investigations to prove the applicability and validity of co-link analysis used in mapping internet structure and mining relationships among internet colonies. All of these studies are based on the whole links in the web called “total co-link analysis”. However, there are both substantive and non-substantive links in the web, and the number of the latter outweights that of the former, which makes the preconditions of total co-link analysis untenable. In this paper, we present “substantive co-link analysis”, and believe it is more sound and valid than “total co-link analysis”. Then exploratory investigations on both total and substantive co-link analysis are carried out with the sample of 20 academic blogs on Library and Information Science, the results of which testify our assumption that “substantive co-link analysis” is more efficient and reasonable than “total co-link analysis”.

Keywords: Analysis, Author Cocitation Analysis, Information-Science, Mining, Modification, Structure, Validity, Web, Web Environment

? Ynalvez, M.A. and Shrum, W. (2008), International graduate training, digital inequality and professional network structure: An ego-centric social network analysis of knowledge producers at the “Global South”. *Scientometrics*, **76** (2), 343-368.

Full Text: [2008\Scientometrics76, 343.pdf](2008/Scientometrics76,%20343.pdf)

Abstract: Based on a face-to-face survey of 312 scientists from government research institutes and state universities in two Philippine locations - Los Banos, Laguna and Munoz, Nueva Ecija - we examine how graduate training and digital factors shape the professional network of scientists at the “Global South.” Results suggest that scientists prefer face-to-face interaction, there is no compelling evidence that digitally-mediated interaction will replace meaningful face-to-face interaction. What is evident is that among none face-to-face modes of communication a reordering maybe in progress. The effect of digital factors - expressed through advance hardware-software-user interaction skills - lies on network features pertaining to size, proportion of male and of core-based alters, and locational diversity. International graduate training and ascribed factors (gender and number of children) also configure the professional network of scientists - actors traditionally viewed as the epitome of rationality and objectivity. We argue that these factors influence knowledge production through a system of patronage and a culture that celebrates patrifocality. We forward the hypothesis that knowledge production at the “Global South” closely fits Callon’s [1995] extended translation model of science.

Keywords: Analysis, Children, Communication, Core, Culture, Evidence, Gender, Graduate, Inequality, Interaction, Internet, Knowledge, Male, Model, Network, Network Analysis, Rationality, Research, Resources, Science, Scientists, Size, Social Network Analysis, Structure, Survey, Tacit Knowledge, Ties, Training, Translation, Universities, Voluntary Organizations

? Lehmann, S., Jackson, A.D. and Lautrup, B.E. (2008), A quantitative analysis of indicators of scientific performance. *Scientometrics*, **76** (2), 369-390.

Full Text: [2008\Scientometrics76, 369.pdf](2008/Scientometrics76,%20369.pdf)

Abstract: Condensing the work of any academic scientist into a one-dimensional indicator of scientific performance is a difficult problem. Here, we employ Bayesian statistics to analyze several different indicators of scientific performance. Specifically, we determine each indicator’s ability to discriminate between scientific authors. Using scaling arguments, we demonstrate that the best of these indicators require approximately 50 papers to draw conclusions regarding long term scientific performance with usefully small statistical uncertainties. Further, the approach described here permits statistical comparison of scientists working in distinct areas of science.

Keywords: Analysis, Comparison, Complex Networks, Indicator, Indicators, Papers, Quantitative Analysis, Scaling, Science, Small, Statistics, Work

? Sonderstrup-Andersen, E.M. and Sonderstrup-Andersen, H.H.K. (2008), An investigation into diabetes researcher’s perceptions of the Journal Impact Factor - reconsidering evaluating research. *Scientometrics*, **76** (2), 391-406.

Full Text: [2008\Scientometrics76, 391.pdf](2008/Scientometrics76,%20391.pdf)

Abstract: Currently the Journal Impact Factors (JIF) attracts considerable attention as components in the evaluation of the quality of research in and between institutions. This paper reports on a questionnaire study of the publishing behaviour and researchers preferences for seeking new knowledge information and the possible influence of JIF on these variables. 54 Danish medical researchers active in the field of Diabetes research took part. We asked the researchers to prioritise a series of scientific journals with respect to which journals they prefer for publishing research and gaining new knowledge. In addition we requested the researchers to indicate whether or not the JIF of the prioritised journals has had any influence on these decisions. Furthermore we explored the perception of the researchers as to what degree the JIF could be considered a reliable, stable or objective measure for determining the scientific quality of journals. Moreover we asked the researchers to judge the applicability of JIF as a measure for doing research evaluations. One remarkable result is that app. 80% of the researchers share the opinion that JIF does indeed have an influence on which journals they would prefer for publishing. As such we found a statistically significant correlation between how the researchers ranked the journals and the JIF of the ranked journals. Another notable result is that no significant correlation exists between journals where the researchers actually have published papers and journals in which they would prefer to publish in the future measured by JIF. This could be taken as an indicator for the actual motivational influence on the publication behaviour of the researchers. That is, the impact factor actually works in our case. It seems that the researchers find it fair and reliable to use the Journal Impact Factor for research evaluation purposes.

Keywords: Behaviour, Citation Analysis, Diabetes, Evaluation, Impact Factor, Indicator, Information, Institutions, Investigation, Journals, Knowledge, Medical, Papers, Perception, Publication, Publishing, Quality, Questionnaire, Research, Research Evaluation, Scientific Journals

? Yu, G. and Yu, D.R. (2008), Design and simulation on the publication delay control system. *Scientometrics*, **76** (3), 407-427.

Full Text: [2008\Scientometrics76, 407.pdf](2008/Scientometrics76,%20407.pdf)

Abstract: Based on the simulation study of the publication delay control process [YU & AL., 2005], transfer function models of delay control processes by adjusting the accepted contribution flux and the published contribution flux are identified using system identification. According to Cybernetics, the feedback control system of the publication delay is designed and control processes are simulated and analyzed when the average publication delay are regarded as the controlled object. On the basis of the relation between the average publication delay and the deposited contribution quantity, another control method is proposed that the deposited contribution quantity is regarded as the controlled object and the simulation result proves that the method is an excellent means and can help editors expediently manage their journals and control publication delays.

Keywords: AL, Control, Function, Identification, Journals, Models, Publication, Publication Delay, Publishing Process, Simulation, Transfer Function

? Plaza, L.M. and Albert, A. (2008), Scientific literature cited in USPTO patent documents as indicators for the evaluation and analysis of Spanish scientific research in biomedical disciplines. *Scientometrics*, **76** (3), 429-438.

Full Text: [2008\Scientometrics76, 429.pdf](2008/Scientometrics76,%20429.pdf)

Abstract: The use of indicators based on the analysis of the scientific literature cited in patent documents is proposed for the evaluation of biomedical research. A study carried out on several groups of researchers working in universities, public research centers, and hospitals, has shown that an important percentage of Spanish scientists have authored publications that are cited in US patents in the field of Biotechnology. The study and analysis of those cites allows a evaluation of the flow of knowledge generated by the different groups of scientists towards the development of technologies, and to learn on the relationship between the characteristics of the cited publications and the frequency they are cited in the patents. The results obtained avail the use of new indicators based on the cites in patents to perform a more complete evaluation of the published research related with Biotechnology and Biomedicine, both at the level of research institutions and individual scientists.

Keywords: Analysis, Biomedical, Biomedical Research, Biotechnology, Characteristics, Development, Evaluation, Field, Flow, Hospitals, Indicators, Institutions, Knowledge, Literature, Patent, Patents, Public, Publications, Research, Science, Scientific Literature, Scientific Research, Technologies, Technology, Universities, US

? Kyvik, S. and Olsen, T.B. (2008), Does the aging of tenured academic staff affect the research performance of universities? *Scientometrics*, **76** (3), 439-455.

Full Text: [2008\Scientometrics76, 439.pdf](2008/Scientometrics76,%20439.pdf)

Abstract: This paper examines the common contentions that the collective aging of tenured academic staff has negative effects on research performance of universities due to (a) negative effects of aging in itself, and (b) to a lack of newcomers who could revitalise the research. Data on academic staff and research at Norwegian universities over two decades have been used to examine these contentions. While older staff published less than their younger colleagues two decades ago, no differences in productivity are found today. Furthermore, during this period, a large increase in the number of post-doctoral fellows and PhD students has taken place, compensating for the aging of tenured staff.

Keywords: Accumulative Advantage, Age, Aging, Performance, Productivity, Research, Research Performance, Scientific Productivity, Students, Universities

? Martin-Sempere, M.J., Garzon-Garcia, B. and Rey-Rocha, J. (2008), Team consolidation, social integration and scientists’ research performance: An empirical study in the Biology and Biomedicine field. *Scientometrics*, **76** (3), 457-482.

Full Text: [2008\Scientometrics76, 457.pdf](2008/Scientometrics76,%20457.pdf)

Abstract: The effects of team consolidation and social integration on individual scientists’ activity and performance were investigated by analysing the relationships between these factors and scientists’ productivity, impact, collaboration patterns, participation in funded research projects and programs, contribution to the training of junior researchers, and prestige. Data were obtained from a survey of researchers ascribed to the Biology and Biomedicine area of the Spanish Council for Scientific Research, and from their curricula vitae. The results show that high levels of team consolidation and of integration of the scientist within his or her team are factors which might help create the most favourable social climate for research performance and productivity. Researchers who carried out their activity in a social climate characterized by these factors participated in more domestic research projects and supervised more doctoral dissertations than the rest of their colleagues. They were also more productive, as shown by the higher number of papers published in journals included in the Journal Citation Reports and the higher number of patents granted. These metrics are the main indicators taken into account in the evaluation of the research activity of Spanish scientists, and are therefore the activities that scientists invest the most energy in with a view to obtaining professional recognition. The results corroborate the importance of research teamwork, and draw attention to the importance of teamwork understood not as two or more scientists working together to solve a problem, but as a complex process involving interactions and interpersonal relations within a particular contextual framework.

Keywords: Climate, Collaboration, Curricula, Energy, Evaluation, Field, Framework, Impact, Indicators, Integration, Journal Citation Reports, Journals, Metrics, Papers, Participation, Patents, Performance, Productivity, Relations, Research, Research Performance, Social, Survey, Teamwork, Training

? Sharma, S. and Thomas, V.J. (2008), Inter-country R&D efficiency analysis: An application of data envelopment analysis. *Scientometrics*, **76** (3), 483-501.

Full Text: [2008\Scientometrics76, 483.pdf](2008/Scientometrics76,%20483.pdf)

Abstract: This study examines the relative efficiency of the R&D process across a group of 22 developed and developing countries using Data Envelopment Analysis (DEA). The R&D technical efficiency is examined using a model with patents granted to residents as an output and gross domestic expenditure on R&D and the number of researchers as inputs. Under CRS (Constant Returns to Scale), Japan, the Republic of Korea and China are found to be efficient, whereas under the VRS (Variable Returns to Scale) framework, Japan, the Republic of Korea, China, India, Slovenia and Hungary are found to be efficient. The emergence of some of the developing nations on the efficiency frontier indicates that these nations can also serve as benchmarks for their efficient use of R&D resources. The inefficiency in the R&D resource usage highlighted by this study indicates the underlying potential that can be tapped for the development and growth of nations.

Keywords: Analysis, Application, Bibliometric Assessment, China, CR, Data, Data Envelopment, Data Envelopment Analysis, DEA, Developing, Developing Countries, Development, Efficiency, Framework, Growth, Hungary, India, Indicators, Innovation, Japan, Korea, Model, Nations, Patent Statistics, Patents, Potential, Publications, Science-Citation-Index, Slovenia, Technical Change, Technology, UK Scientific Performance

? Lee, W.H. (2008), How to identify emerging research fields using scientometrics: An example in the field of Information Security. *Scientometrics*, **76** (3), 503-525.

Full Text: [2008\Scientometrics76, 503.pdf](2008/Scientometrics76,%20503.pdf)

Abstract: In the highly competitive world, there has been a concomitant increase in the need for the research and planning methodology, which can perform an advanced assessment of technological opportunities and an early perception of threats and possibilities of the emerging technology according to the nation’s economic and social status. This research is aiming to provide indicators and visualization methods to measure the latest research trend and aspect underlying scientific and technological documents to researchers and policy planners using “co-word analysis”. Information Security field is a highly prospective market value. In this paper, we presented an analysis Information Security. Co-word analysis was employed to reveal patterns and trends in the Information Security fields by measuring the association strength of terms representatives of relevant publications or other texts produced in the Information Security field. Data were collected from SCI and the critical keywords could be extracted from the author keywords. These extracted keywords were further standardized. In order to trace the dynamic changes in the Information Security field, we presented a variety of technology mapping. The results showed that the Information Security field has some established research theme and also rapidly transforms to embrace new themes.

Keywords: Analysis, Area, Assessment, Association, Changes, Cocitation, Competitive, Dynamic, Economic, Field, Indicators, Mapping, Market, Measure, Methodology, Methods, Networks, Perception, Performance, Planning, Policy, Prospective, Publications, Research, Research Trend, SCI, Scientometrics, Social, Strength, Technology, Trend, Trends, Value, Visualization, Word, World

? Nicolini, C. and Nozza, F. (2008), Objective assessment of scientific performances world-wide. *Scientometrics*, **76** (3), 527-541.

Full Text: [2008\Scientometrics76, 527.pdf](2008/Scientometrics76,%20527.pdf)

Abstract: In order to identify the indicators having world-wide standards for the assessment of scientific performances at the level of both individual and institutions normalized for disciplines, we have carried out a comparative analysis of the relative scientific and technological level of individual scientists and individual scientific institutions competing internationally for given fields, using alternative indicators all based on the number of publications and on their impact factors in international SCI journals properly ranked properly weighted for their position, number of coauthors and discipline using deciles. This study, contrary to some gloomy opinions, suggests that interesting conclusions can be drawn from the above indicators. The utilization of the chosen indicators, tested world-wide in real situations, appears capable to effectively and objectively assess institutions and individual university professors and researchers proving to be quite significant and should be used to provide computer-assisted evaluation criteria for either maintaining or upgrading the given position, maintaining or closing public Institutions, and filtering grant applications.

Keywords: Alternative, Analysis, Assessment, Bibliometric Indicators, Criteria, Evaluation, Impact, Impact Factors, Indicators, Institutions, International, Journals, Opinions, Public, Publications, SCI, Scientific Institutions, Standards, University, Utilization

? Onder, C., Sevkli, M., Altinok, T. and Tavukcuoglu, C. (2008), Institutional change and scientific research: A preliminary bibliometric analysis of institutional influences on Turkey’s recent social science publications. *Scientometrics*, **76** (3), 543-560.

Full Text: [2008\Scientometrics76, 543.pdf](2008/Scientometrics76,%20543.pdf)

Abstract: This paper provides a detailed assessment of recent indexed journal publications by Turkish social scientists. We first present information on SCI, SSCI and AHCI indexed journal articles that were published by Turkish researchers over the past three decades. An inspection of publication statistics indicates a considerable improvement, especially during the last five years of the 1973-2005 period that we examine, in Turkey’s publication record in terms of number of articles authored or co-authored by Turkish researchers. In the next step, we scrutinize institutional sources of this improvement, emphasizing regulatory and organizational changes that have both forced researchers to publish in indexed journals and remunerated those who did so. Finally, we provide a qualitative assessment of recent improvement in publication performance of Turkish researchers by focusing on a particular behavioral consequence of institutional changes and its implications for impact that research from Turkey has on global research activity. Bibliometric analysis of articles published by Turkish researchers in SSCI-indexed journals during 2000-2005 shows that recent regulatory and organizational changes seem to have instituted a particular publication habit, publishing in journals with lower impact factor, which was earlier observed in other parts of the world where publication counts were used for performance evaluation, and that signs of improvement in our select indicators of impact are yet to be observed.

Keywords: Analysis, Assessment, Bibliometric, Bibliometric Analysis, Biomedical Literature 1988-1997, Changes, Evaluation, First, Impact, Impact Factor, Improvement, Indicators, Information, Inspection, Journal, Journal Articles, Journals, Organizational, Output, Performance, Performance Evaluation, Physics, Publication, Publication Counts, Publication Record, Publication Statistics, Publications, Publishing, Qualitative, Record, Research, SCI, Science, Scientific Research, Social, Sources, SSCI, Statistics, Turkey, University, World

? Manjarres-Henriquez, L., Gutierrez-Gracia, A. and Vega-Jurado, J. (2008), Coexistence of university-industry relations and academic research: Barrier to or incentive for scientific productivity. *Scientometrics*, **76** (3), 561-576.

Full Text: [2008\Scientometrics76, 561.pdf](2008/Scientometrics76,%20561.pdf)

Abstract: In this article we analyse whether university-industry relations (UIR) are penalising research activity and inhibiting university researchers’ scientific productivity and, if so, to what extent. The analysis is based on a case study of two Spanish universities. We find that UIR exercise a positive effect on university scientific productivity only when they are based on the development of R&D contracts, and when the funds obtained through these activities do not exceed 15% of the researcher’s total budget. We also find that researchers who combine research and UIR activities obtain higher funding from competitive public sources than that engage only in research. In addition, their average scientific productivity is higher and they achieve higher status within their institutions than those members of faculty who concentrate only on research.

Keywords: Analysis, Budget, Case Study, Collaboration, Competitive, Concentrate, Contracts, Development, Exercise, Faculty, Funding, Government Relations, Institutions, Productivity, Public, Relations, Research, Research Performance, Science, Scientific Productivity, Sources, Triple-Helix, Universities, University

Anderson, T.R., Hankin, R.K.S. and Killworth, P.D. (2008), Beyond the Durfee square: Enhancing the h-index to score total publication output. *Scientometrics*, **76** (3), 577-588.

Full Text: [2008\Scientometrics76, 577.pdf](2008/Scientometrics76,%20577.pdf)

Abstract: An individual’s h-index corresponds to the number h of his/her papers that each has at least h citations. When the citation count of an article exceeds h, however, as is the case for the hundreds or even thousands of citations that accompany the most highly cited papers, no additional credit is given (these citations falling outside the so-called “Durfee square”). We propose a new bibliometric index, the “tapered h-index” (h(T)), that positively enumerates all citations, yet scoring them on an equitable basis with h. The career progression of h(T) and h are compared for six eminent scientists in contrasting fields. Calculated h(T) for year 2006 ranged between 44.32 and 72.03, with a corresponding range in h of 26 to 44. We argue that the h(T)-index is superior to h, both theoretically (it scores all citations), and because it shows smooth increases from year to year as compared with the irregular jumps seen in h. Conversely, the original h-index has the benefit of being conceptually easy to visualise. Qualitatively, the two indices show remarkable similarity (they are closely correlated), such that either can be applied with confidence.

Keywords: Bibliometric, Citation, Citations, Confidence, h Index, h-Index, Impact Factor, Index, Indices, Papers, Publication, Researchers, Science, Scientists, Similarity, Skewness

? Lee, B. and Jeong, Y.I. (2008), Mapping Korea’s national R&D domain of robot technology by using the co-word analysis. *Scientometrics*, **77** (1), 3-19.

Full Text: [2008\Scientometrics77, 3.pdf](2008/Scientometrics77,%203.pdf)

Abstract: In this paper, we show a “Strategic Diagram” of the robot technology by applying the co-word analysis to the metadata of Korean related national R&D projects in 2001. The strategic diagram shows the evolutionary trends of the specific R&D domain and relational patterns between sub-domains. We may use this strategic diagram to support both the strategic planning and the R&D Program.

Keywords: Analysis, Co-Word Analysis, Cocitation, Network, Planning, Strategic, Strategic Planning, Support, Technology, Trends

? Davarpanah, M.R. and Aslekia, S. (2008), A scientometric analysis of international LIS journals: Productivity and characteristics. *Scientometrics*, **77** (1), 21-39.

Full Text: [2008\Scientometrics77, 21.pdf](2008/Scientometrics77,%2021.pdf)

Abstract: This paper presents a quantitative study of productivity, characteristics and various aspects of global publication in the field of library and information science (LIS). A total of 894 contributions published in 56 LIS journals indexed in SSCI during the years of 2000-2004 were analyzed. A total of 1361 authors had contributed publications during the five years. The overwhelming majority (89.93%) of them wrote one paper, The average number of authors per paper is 1.52. All the studied papers were published in English. The sum of research output of the authors form USA and UK reaches 70% of the total productivity. Most papers received few citations. Each article received on an average 1.6 citations and the LIS researchers cite mostly latest articles. About 48% of citing authors had tendency of self-citation. The productive authors, their contribution and authorship position are listed to indicate their productivity and degree of involvement in their research publications.

Keywords: Analysis, Articles, Authorship, Characteristics, Citation, Citations, Field, Impact, Information, Information Science, Information-Science, International, Journals, Library, Library And Information Science, LIS, Papers, Productivity, Publication, Publications, Research, Science, Scientometric, Self-Citation, SSCI, UK, USA

? Levitt, J.M. and Thelwall, M. (2008), Patterns of annual citation of highly cited articles and the prediction of their citation ranking: A comparison across subjects. *Scientometrics*, **77** (1), 41-60.

Full Text: [2008\Scientometrics77, 41.pdf](2008/Scientometrics77,%2041.pdf)

Abstract: High citation is associated with research quality and consequently findings on highly cited articles are useful to increase understanding of the factors that produce high quality research. This study explores highly cited articles in six Subjects, focusing on late citation and peak citation years. Longitudinal citation patterns were found to be highly varied and, oil average, different from the remaining articles in each subject. For four of the six subjects, there is a correlation of over 0.42 between the percentage of early citations and total citation ranking but more highly ranked articles had a lower percentage of early citations. Surprisingly, for highly cited articles in all six subjects the prediction of citation ranking of from the sum of citations during their first six years was less accurate than prediction using the sum of the citations for only the fifth and sixth year.

Keywords: Citation, Citation Patterns, Citations, Comparison, Correlation, First, Prediction, Quality, Ranking, Research, Research Quality, Science, Sleeping Beauties, Understanding

? van Campenhout, G., van Caneghem, T. and van Uytbergen, S. (2008), A comparison of overall and sub-area journal influence: The case of the accounting literature. *Scientometrics*, **77** (1), 61-90.

Full Text: [2008\Scientometrics77, 61.pdf](2008/Scientometrics77,%2061.pdf)

Abstract: In most scientific disciplines, a number of divergent and often highly specialized research areas are examined, which is reflected in substantial differences among journal scopes. Using the accounting literature as an example, we argue that this diversity in scopes should be considered when assessing journal influence. Concretely, we examine a citation-based structural influence measure for a sample of 41 accounting journals. Next, we identify sub-areas in the accounting literature and we explore journal influence in these sub-areas. Our results clearly demonstrate the importance of distinguishing between overall and sub-area influence. In addition, we show that sub-areas should be identified using a fuzzy clustering procedure.

Keywords: Accounting Journals, Assessing, Author Self-Citations, Clustering, Cocitation Analysis, Comparison, Diversity, Economics Journals, Finance, Impact Factor, Index, Journal, Journal Influence, Journals, Literature, Measure, Network, Perceptions, Procedure, Quality, Research, Science

? Cho, S.R. (2008), New evaluation indexes for articles and authors’ academic achievements based on Open Access Resources. *Scientometrics*, **77** (1), 91-112.

Full Text: [2008\Scientometrics77, 91.pdf](2008/Scientometrics77,%2091.pdf)

Abstract: In Open Access (OA) environment where article-based or author-based evaluation is important, a nexv evaluation system is needed to accommodate characteristics of Open Access Resources (OAR) and to overcome limitations of pre-existing evaluation systems such as journal-based evaluation. Primary and secondary evaluation factors were selected. Primary factors include hits and citations that constitutes composite index. Several secondary factors each for article and author evaluation were selected for normalization of the indexes. To validate superiority of newly developed normalized composite index systems compared to the monovariable index system, time-driven bias and power of discrimination were adopted. The results led to the conclusion that composite index proved to be a more stable index offsetting the negative effects from one element to another and normalization makes the composite index even more stable by controlling the bias from external elements.

Keywords: Author Evaluation, Bias, Characteristics, Citation, Citations, Composite, Discrimination, Environment, Evaluation, Impact, Index, Normalization, Power, Ranking, Research Performance, Systems

? Xie, S.D., Zhang, J. and Ho, Y.S. (2008), Assessment of world aerosol research trends by bibliometric analysis. *Scientometrics*, **77** (1), 113-130.

Full Text: [2008\Scientometrics77, 113.pdf](2008/Scientometrics77,%20113.pdf)

Abstract: This study was to explore a bibliometric approach to quantitatively assessing current research trends on atmospheric aerosol, using the related literature in the Science Citation Index (SCI) database from 1991 to 2006. Articles were concentrated on the analysis by scientific output, research performances by individuals, institutes and countries, and trends by the frequency of keywords used. Over the years, there had been a notably growth trend in research outputs, along with more participation and collaboration of institutes and countries. Research collaborative papers shifted from national inter-institutional to international collaboration. The decreasing share of world total and independent articles by the seven major industrialized countries (G7) was examined. Aerosol research in environmental and chemical related fields other than in medical fields was the mainstream of current years. Finally, author keywords, words in title and keywords plus were analyzed contrastively, with research trends and recent hotspots provided.

Keywords: Aerosol, Articles, Atmospheric Aerosol, Author Keywords, Bibliometric, Bibliometric Analysis, Chemical-Characterization, Chemistry, Citation, Collaboration, Database, Emissions, Frequency, Growth, International, International Collaboration, Language, Literature, Medical, Organic Aerosol, Particulate Matter, Pollution, Research, Research Trends, SCI, Science, Science Citation Index, Sciences, Scientific Output, Trend, Trends, Ultrafine Particles, United-States

? Lascurain-Sanchez, M.L., Garcia-Zorita, C., Martin-Moreno, C., Suarez-Balseiro, C. and Sanz-Casado, E. (2008), Impact of health science research on the Spanish health system, based on bibliometric and healthcare indicators. *Scientometrics*, **77** (1), 131-146.

Full Text: [2008\Scientometrics77, 131.pdf](2008/Scientometrics77,%20131.pdf)

Abstract: The present study aimed to determine the possible impact of medical research on the Spanish health system. To this end, an analysis was conducted of Spanish researchers’ scientific production, measured in terms of the publications cited in MEDLINE, along with a series of economic, demographic and socio-sanitary data such as the R&D resources allocated to medical science, the actual population during the period Studied mortality, morbidity and drug spending. The results showed increases in all the variables studied, identified the areas most intensely researched and defined the relationship between this information and the chief causes of mortality. morbidity and drug spending.

Keywords: Analysis, Bibliometric, Biomedical-Research, Citation-Index, Data, Drug, Economic, Health, Health System, Impact, Indicators, Information, Medical, Medical Research, Medline, Morbidity, Mortality, Population, Publications, Research, Science, Science Research, Scientific Production

? Gauffriau, M., Larsen, P.O., Maye, I., Roulin-Perriard, A. and von Ins, M. (2008), Comparisons of results of publication counting using different methods. *Scientometrics*, **77** (1), 147-176.

Full Text: [2008\Scientometrics77, 147.pdf](2008/Scientometrics77,%20147.pdf)

Abstract: Using a database for publications established at CEST and covering the period from 1981 to 2002 the differences in national scores obtained by different Counting methods have been measured. The results are supported by analysing data from the literature. Special attention has been paid to the comparison between the EU and the USA. There are big differences between scores obtained by different methods. In one instance the reduction in scores going from whole to complete-normalized (fractional) counting is 72 per cent. In the literature there is often not enough information given about methods used, and no sign of a clear and consistent terminology and of agreement on properties of and results from different methods. As a matter of fact, Whole counting is favourable to certain countries, especially countries with a high level of international cooperation. The problems are increasing with time because of the ever-increasing national and international cooperation in research and the increasing average number of authors per publication. The need for a common understanding and a joint effort to rectify the situation is stressed.

Keywords: Bibliometric Assessment, British Science, Citation, Comparison, Cooperation, Data, Database, Decline, EU, Indicators, Information, International, International Cooperation, Literature, Methods, Multiple Authorship, Output, Productivity Measures, Publication, Publications, Reduction, Research, Standards, Terminology, UK Scientific Performance, Understanding, USA

? Huang, Y., Yang, Q. and Ao, X.L. (2008), Bibliometric analysis of pentachlorophenol remediation methods during the period of 1994 to 2005. *Scientometrics*, **77** (1), 177-186.

Full Text: [2008\Scientometrics77, 177.pdf](2008/Scientometrics77,%20177.pdf)

Abstract: A bibliometric analysis was performed to assess the quantitative trend of published pentachlorophenol (PCP) remediation studies, including both degradation and sorption. The documents studies were retrieved from the Science Citation Index (SCI) for the period from 1994 to 2005. The trends were analyzed with the retrieved results in publication language, document type, page count. publication output, publication pattern, authorship, citation analysis and country of publication. The results indicated that degradation was the emphasis for PCP remediation. The average impact factor of the journals was higher for publishing degradation studies in comparison to that publishing sorption studies. And there was a positive correlation between CPP and IF for journals published more than two papers. The publishing Countries of both degradation and sorption denoted that most of these researches were done by USA and Canada. Two to four authors was the most popular level of co-authorship.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Canada, Citation, Citation Analysis, Co-Authorship, Coauthorship, Comparison, Correlation, Country, Degradation, Impact, Impact Factor, Journals, Methods, Mineralization, Ozonation, Papers, Pattern, Publication, Publishing, Remediation, SCI, Science Citation Index, Sorption, Trend, Trends, USA, Water

? Glänzel, W. (2008), On some new bibliometric applications of statistics related to the h-index. *Scientometrics*, **77** (1), 187-196.

Full Text: [2008\Scientometrics77, 187.pdf](2008/Scientometrics77,%20187.pdf)

Abstract: In this paper some new fields of application of Hirsch-related statistics are presented. Furthermore, so far unrevealed properties of the h-index are analysed in the context of rank-frequency and extreme-value statistics.

Keywords: Application, Bibliometric, Citation Impact, Context, h Index, h-Index, Journals, Statistics

? Zsindely, S. (2008), From vanity fair to scientific research: The place of genealogy in contemporary science. A scientometric approach. *Scientometrics*, **77** (1), 197-206.

Full Text: [2008\Scientometrics77, 197.pdf](2008/Scientometrics77,%20197.pdf)

Abstract: The place of genealogy in present scientific research has been investigated by scientometric methods. The term “genealogy” and related words were searched in the title, keywords, and abstracts of science journals for the period 1975-2006. It was concluded that 1991 onward the number of articles about “applied” genealogy has increased dramatically, whereas that of classical (or “pure”) genealogy only modestly. In contemporary science, the fields medicine and genetics are those who profit most from human genealogy. More than forty percent of the medical articles containing the search terms were from the neurology and oncology in the period investigated.

Keywords: Approach, Genetics, Human, Journals, Medical, Medicine, Methods, Neurology, Oncology, Profit, Research, Science, Science Journals, Scientific Research, Scientometric, Term

Notes: CCountry

? Riikonen, P. and Vihinen, M. (2008), National research contributions: A case study on Finnish biomedical research. *Scientometrics*, **77** (2), 207-222.

Full Text: [Scientometrics77, 207.pdf](2008/Scientometrics77,%20207.pdf)

Abstract: The long-term influence and contribution of research can be evaluated relatively reliably by bibliometric citation analysis. Previously, productivity of nations has been estimated by using either the number of published articles or journal impact factors and/or citation data. These studies show certain trends, but detailed analysis is not possible due to the assumption that all articles in a journal were equally cited. Here we describe the first comprehensive, longterm, nationwide analysis of scientific performance. We studied the lifetime research output of 748 Finnish principal investigators in biomedicine during the years 1966-2000, analysed national trends, and made a comparison with international research production. Our results indicate that analyses of the scientific contribution of persons, disciplines, or nations should be based on actual publication and citation counts rather than on derived information like impact factors. 51% of the principal investigators have published altogether 75% of the articles, however, the whole scientific community has contributed to the growth of biomedical research in Finland since the Second World War.

Keywords: Analyses, Analysis, Bibliometric, Biomedical, Biomedical Research, Biomedicine, Case Study, Citation, Citation Analysis, Citation Counts, Community, Comparison, Data, European-Union, Finland, First, Growth, Health, Impact, Impact Factor, Impact Factors, Information, International, Journal, Journal Impact, Journal Impact Factors, Journals, Long Term, Long-Term, Nations, NOV, Performance, Productivity, Publication, Publications, Research, Research Output, Scientific Performance, Skewness, Trends

? Rousseau, S. (2008), Journal evaluation by environmental and resource economists: A survey. *Scientometrics*, **77** (2), 223-233.

Full Text: [2008\Scientometrics77, 223.pdf](2008/Scientometrics77,%20223.pdf)

Abstract: Using an online survey, we have asked the researchers in the field of environmental and resource economics how they themselves would rank a representative list of journals in their field. The results of this ranking are then compared to the ordering based on the journals’ impact factors as published by Thomson Scientific. The two sets of rankings seem to be positively correlated, but statistically the null hypothesis that the two rankings are uncorrelated cannot be rejected. This observation suggests that researchers interpret the current quality of journals based on other factors in addition to the impact factors.

Keywords: Economics, Environmental, Evaluation, Field, Impact, Impact Factors, Journals, NOV, Observation, Quality, Quality Of, Rank, Ranking, Rankings, Relative Impacts, Survey

? Larsen, P.O. (2008), The state of the art in publication counting. *Scientometrics*, **77** (2), 235-251.

Full Text: [2008\Scientometrics77, 235.pdf](2008/Scientometrics77,%20235.pdf)

Abstract: The proceedings of the ISSI conferences in Stockholm, 2005, and Madrid, 2007, contain 85 contributions based on publication counting. The methods used in these contributions have been analyzed. The counting methods used are stated explicitly in 26 contributions and can be derived implicitly from the discussion of methods in 10 contributions. In only five contributions, there is a justification for the choice of method. Only one contribution gives information about different results obtained by using different methods. The non-additive results from whole counting give problems in the calculation of shares in seven contributions, but these problems are not mentioned. Only 11 contributions give a term (terms) for the counting method(s) used. To illustrate the problems, 11 of the contributions are discussed in detail. The conclusion is that 40 years of publication counting have not resulted in general agreement on definitions of methods and terminology nor in any kind of standardization.

Keywords: Art, Bibliometric Assessment, Calculation, Choice, Collaboration, Conferences, General, Information, Methods, NOV, Publication, Standardization, State, Term, Terminology, UK Scientific Performance

? Harwood, N. (2008), Publication outlets and their effect on academic writers’ citations. *Scientometrics*, **77** (2), 253-265.

Full Text: [2008\Scientometrics77, 253.pdf](2008/Scientometrics77,%20253.pdf)

Abstract: This article focuses on how and why the publication outlets in which academic writers’ work appears can impact on their citations, as part of a qualitative interview-based study of computer scientists’ and sociologists’ citing behaviour. Informants spoke of how they cited differently when writing in outlets aimed at a less knowledgeable audience, and for audiences from different disciplines and in different parts of the world. Citation behaviour can also be affected when writing for journals which favour different research paradigms, and the word limits journals impose led some informants to cite more selectively than they would have wished. The implications of the findings and the strengths and weaknesses of the interview-based method of investigation are also discussed.

Keywords: Behavior, Behaviour, Citations, Citer Motivations, Communication, Impact, Informants, Investigation, Journals, Model, NOV, Publication, Qualitative, Research, Self-Citation, Work, World

? Costas, R. and Bordons, M. (2008), Is g-index better than h-index? An exploratory study at the individual level. *Scientometrics*, **77** (2), 267-288.

Full Text: [2008\Scientometrics77, 267.pdf](2008/Scientometrics77,%20267.pdf)

Abstract: The ability of g-index and h-index to discriminate between different types of scientists (low producers, big producers, selective scientists and top scientists) is analysed in the area of Natural Resources at the Spanish CSIC (WoS, 1994-2004). Our results show that these indicators clearly differentiate low producers and top scientists, but do not discriminate between selective scientists and big producers. However, g-index is more sensitive than h-index in the assessment of selective scientists, since this type of scientist shows in average a higher g-index/h-index ratio and a better position in g-index rankings than in the h-index ones. Current research suggests that these indexes do not substitute each other but that they are complementary.

Keywords: Assessment, Bibliometric Indicators, Citation Impact, Complementary, CSIC, g Index, g-Index, h Index, h-Index, Indicators, Journals, NOV, Output, Publication, Ranking, Rankings, Research, Researchers, Science, Scientists, System

? Igami, M. (2008), Exploration of the evolution of nanotechnology via mapping of patent applications. *Scientometrics*, **77** (2), 289-308.

Full Text: [2008\Scientometrics77, 289.pdf](2008/Scientometrics77,%20289.pdf)

Abstract: This study explored the evolution of nanotechnology based on a mapping of patent applications. Citations among patent applications designated to the European Patent Office were intensively analysed. Approximately 4300 nanotechnology patent applications linked through citations were mapped. Fifteen domains of nanotechnology patent applications were found in the map in 2003. The domains cover a wide range of application fields, they are domains related to measurement and manufacturing, electronics, optoelectronics, biotechnology, and nano materials. Maps in several reference years registered the evolution of nanotechnology, where the breadth of application fields has been broadening over time. Direct and indirect knowledge flows among different domains of nanotechnology are seemingly small at the present. Each domain of nanotechnology is likely pushing the technological frontier within its own domain. The exception is sensing and actuating technologies on the nanometre scale. Direct and indirect knowledge flows to/from this domain describe their vital role in nanotechnology. Countries’ specialisation was also analysed. Patent applications from the United States and the European Union cover a wide range of nanotechnology. Inventive activities in Japan are, however, strongly focusing on electronics. Intensive knowledge creation in specific technologies was found in Switzerland and Korea.

Keywords: Application, Biotechnology, Citations, European Union, Evolution, Japan, Knowledge, Korea, Manufacturing, Mapping, Measurement, Nanotechnology, NOV, Patent, Reference, Role, Scale, Science, Small, Switzerland, Technologies, Technology, United States

? Jonkers, K. and Tijssen, R. (2008), Chinese researchers returning home: Impacts of international mobility on research collaboration and scientific productivity. *Scientometrics*, **77** (2), 309-333.

Full Text: [2008\Scientometrics77, 309.pdf](2008/Scientometrics77,%20309.pdf)

Abstract: The aim of this study is to contribute to the debate on the relationship between scientific mobility and international collaboration. This case study deals with leading Chinese researchers in the field of plant molecular life sciences who returned to their home country. A correlation analysis of their mobility history, publication output, and international co-publication data, shows the relationship between scientific output, levels of international collaboration and various individual characteristics of returned researchers. The outcome of the analysis suggests that while host countries may loose human capital when Chinese scientists return home, the so-called “return brain drain”, they may also gain in terms of scientific linkages within this rapidly emerging and globalizing research field.

Keywords: Analysis, Brain, Brain-Drain, Case Study, Characteristics, Chinese, Collaboration, Correlation, Correlation Analysis, Country, Data, Field, Growth, History, Host, Human, International, Life, Life Sciences, Migration, Mobility, NOV, Outcome, Plant, Productivity, Publication, Research, Research Collaboration, Science, Sciences, Scientific Output, Scientific Productivity

? Qiu, J.P., Ma, R.M. and Cheng, N. (2008), New exploratory work of evaluating a researcher’s output. *Scientometrics*, **77** (2), 335-344.

Full Text: [2008\Scientometrics77, 335.pdf](2008/Scientometrics77,%20335.pdf)

Abstract: SCI has been popular all over the world since it was published by Garfield in 1963. Researches on evaluating a researcher’s output with SCI have always been continuous. In recent years, a great breakthrough has been made since the h-index was put forward in 2005. In this paper, we also advance a new method - Paper Quality Index (PQI) to evaluate the output of a researcher. The main purpose of our method is to solve two problems that consist in the method of h-index: one is that the h-index can’t compare the outputs of researchers in different fields, the other is that it is unsuitable for evaluating the outputs of young researchers. A simple mathematical expression is constructed to eliminate the difference of citation among different fields and makes the evaluation of short-term outputs of researchers possible.

Keywords: Advance, Breakthrough, Citation, Constructed, Evaluation, Expression, h Index, h-Index, Index, NOV, Purpose, SCI, Work, World

? Vanecek, J. (2008), Bibliometric analysis of the Czech research publications from 1994 to 2005. *Scientometrics*, **77** (2), 345-360.

Full Text: [2008\Scientometrics77, 345.pdf](2008/Scientometrics77,%20345.pdf)

Abstract: We have compared bibliometric data of Czech research papers generated from 1994 to 2005 with papers from six other EU countries: Austria, Hungary, Poland, Finland, Ireland and Greece. The Czech Republic ranked the fifth in number of papers per thousand inhabitants and the sixth in number of citations/paper. Relatively the most cited were Czech papers from fields Engineering and Mathematics ranking the third, and Computer Science, Environment/Ecology and Molecular Biology ranking the fourth among 7 EU countries. Our analysis indicates that Czech research is lagging behind the leading EU countries, but its output is proportional to the R&D expenses.

Keywords: Analysis, Austria, Bibliometric, Bibliometric Analysis, Citation, Czech Republic, Data, EU, Europe, Fields, Finland, Greece, Hungary, Ireland, NOV, Papers, Publications, Ranking, Research, Science

? da Luz, M.P., Marques-Portella, C., Mendlowicz, M., Gleiser, S., Coutinho, E.S.F. and Figueira, I. (2008), Institutional h-index: The performance of a new metric in the evaluation of Brazilian Psychiatric Post-graduation Programs. *Scientometrics*, **77** (2), 361-368.

Full Text: [2008\Scientometrics77, 361.pdf](2008/Scientometrics77,%20361.pdf)

Abstract: A fair assessment of merit is needed for better resource allocation in the scientific community. We analyzed the performance of the institutional h-index in the case of Brazilian Psychiatry Post-graduation Programs. Traditional bibliometric indicators and the institutional h-index similarly ranked the programs, except for the Average Impact Factor. The institutional h-index correlated strongly with the majority of the traditional bibliometric indicators, which did not occur with the Average Impact Factor. The institutional h-index balances “quantity” and “quality”, and can be used as part of a panel of bibliometric indicators to aid the peer-review process.

Keywords: Allocation, Assessment, Bibliometric, Bibliometric Indicators, Citation Indexes, Community, Decisions, Evaluation, h Index, h-Index, Impact Factor, Indicators, Journals, NOV, Peer Review, Peer-Review, Performance, Quality, Ranking, Resource Allocation, Scientific-Research Output, Work

? Glänzel, W. (2008), h-index concatenation. *Scientometrics*, **77** (2), 369-372.

Full Text: [2008\Scientometrics77, 369.pdf](2008/Scientometrics77,%20369.pdf)

Abstract: A method for the calculation of a ‘concatenated’ h-index of jointly ranked combined bibliographies is presented in the case when only size and h-index of the original publication sets are known.

Keywords: Bibliographies, Calculation, h Index, h-Index, NOV, Publication, Size

? Zhivotovsky, L.A. and Krutovsky, K.V. (2008), Self-citation can inflate h-index. *Scientometrics*, **77** (2), 373-375

Full Text: [2008\Scientometrics77, 373.pdf](2008/Scientometrics77,%20373.pdf)

Keywords: h Index, h-Index, NOV

? Egghe, L. (2008), Modelling successive h-indices. *Scientometrics*, **77** (3), 377-387.

Full Text: [2008\Scientometrics77, 377.pdf](2008/Scientometrics77,%20377.pdf)

Abstract: From a list of papers of an author, ranked in decreasing order of the number of citations to these papers one can calculate this author’s Hirsch index (or h-index). If this is done for a group of authors (e. g. from the same institute) then we can again list these authors in decreasing order of their h-indices and from this, one can calculate the h-index of (part of) this institute. One can go even further by listing institutes in a country in decreasing order of their h-indices and calculate again the h-index as described above. Such h-indices are called by SCHUBERT [2007] “successive” h-indices. In this paper we present a model for such successive h-indices based on our existing theory on the distribution of the h-index in Lotkaian informetrics. We show that, each step, involves the multiplication of the exponent of the previous h-index by 1/alpha where alpha > 1 is a Lotka exponent. We explain why, in general, successive h-indices are decreasing. We also introduce a global h-index for which tables of individuals (authors, institutes,.) are merged. We calculate successive and global h-indices for the (still active) D. De Solla Price awardees.

Keywords: Authors, Citations, Country, Distribution, General, Group, h Index, h-Index, Hirsch, Hirsch Index, Index, Informetrics, Lotka, Lotkaian Informetrics, Model, Modelling, Papers, Theory

? Dastidar, P.G. and Ramachandran, S. (2008), Intellectual structure of Antarctic science: A 25-years analysis. *Scientometrics*, **77** (3), 389-414.

Full Text: [2008\Scientometrics77, 389.pdf](2008/Scientometrics77,%20389.pdf)

Abstract: To delineate the intellectual structure of Antarctic science, the research outputs on Antarctic science have been analyzed for a period of 25 years (1980-2004) through a set of scientometrics and network analysis techniques. The study is based on 10,942 records (research articles, letters, reviews, etc.), published in 961 journals/documents, and retrieved from the Science Citation Index (SCI) database. Over the years interest in Antarctic science has increased, as is evident from the growing number of ratified countries and research stations. During the period under study, the productivity has increased 3-times and there is a 13-fold increase in collaborative articles. Attempt has been made to identify important players like scientists, organizations and countries working in the field and to identify frontier areas of research that is being conducted in this continent. The highest 41% scientific output is contributed by the USA and the UK, followed by Australia and Germany. British Antarctic Survey (BAS), UK and Alfred Wegener Institute of Polar & Marine Research, Germany are the most productive institutes in Antarctic science. Maximum number of research articles on Antarctic science, have been published in the journal Polar Biology, indicating substantial work being done on the biology of this continent. The journals-Nature and Science are the highly-cited journals in Antarctic science. The paper written by J. C. Farman et al., published in Nature in 1985, reporting depletion of ozone layer, is the most-cited article. Semantic relationships between cited documents were measured through co-citation analysis. J. C. Farman and S. Solomon are co-cited most frequently.

Keywords: Analysis, Antarctic Science, Australia, Biology, British, Citation, Co-Citation, Co-Citation Analysis, Cocitation, Database, Field, Germany, Intellectual Structure, Journal, Journals, Network, Network Analysis, Networks, Ozone, Ozone Layer, Productivity, Records, Relationships, Reporting, Research, Reviews, SCI, Science, Science Citation Index, Scientific Output, Scientometrics, Structure, Techniques, UK, USA, Work

? Bornmann, L., Nast, I. and Daniel, H.D. (2008), Do editors and referees look for signs of scientific misconduct when reviewing manuscripts? A quantitative content analysis of studies that examined review criteria and reasons for accepting and rejecting manuscripts for publication. *Scientometrics*, **77** (3), 415-432.

Full Text: [2008\Scientometrics77, 415.pdf](2008/Scientometrics77,%20415.pdf)

Abstract: The case of Dr. Hwang Woo Suk, the South Korean stem-cell researcher, is arguably the highest profile case in the history of research misconduct. The discovery of Dr. Hwang’s fraud led to fierce criticism of the peer review process (at Science). To find answers to the question of why the journal peer review system did not detect scientific misconduct (falsification or fabrication of data) not only in the Hwang case but also in many other cases, an overview is needed of the criteria that editors and referees normally consider when reviewing a manuscript. Do they at all look for signs of scientific misconduct when reviewing a manuscript? We conducted a quantitative content analysis of 46 research studies that examined editors’ and referees’ criteria for the assessment of manuscripts and their grounds for accepting or rejecting manuscripts. The total of 572 criteria and reasons from the 46 studies could be assigned to nine main areas: (1) ‘relevance of contribution,’ (2) ‘writing/presentation,’ (3) ‘design/conception,’ (4) ‘method/statistics,’ (5) ‘discussion of results,’ (6) ‘reference to the literature and documentation,’ (7) ‘theory,’ (8) ‘author’s reputation/institutional affiliation,’ and (9) ‘ethics.’ None of the criteria or reasons that were assigned to the nine main areas refers to or is related to possible falsification or fabrication of data. In a second step, the study examined what main areas take on high and low significance for editors and referees in manuscript assessment. The main areas that are clearly related to the quality of the research underlying a manuscript emerged in the analysis frequently as important: ‘theory,’ ‘design/conception’ and ‘discussion of results.’.

Keywords: Affiliation, Analysis, Assessment, Content Analysis, Contribution, Criteria, Data, Discovery, Documentation, Ethics, History, Journal, Journals, Korean, Literature, Peer, Peer Review, Peer-Review, Process, Publication, Quality, Quality of, Referees, Reference, Relevance, Research, Review, Review Process, Scientific Misconduct, Significance, Stem Cell, Stem-Cells, Theory

? Vaughan, L. and You, J. (2008), Content assisted web co-link analysis for competitive intelligence. *Scientometrics*, **77** (3), 433-444.

Full Text: [2008\Scientometrics77, 433.pdf](2008/Scientometrics77,%20433.pdf)

Abstract: Building on a previous study that succeeded in mapping business competition positions at an industry level using Web co-link analysis, the current study attempted to improve Web co-link analysis by adding Web page content to obtain the mapping at a particular market segment level. This method combines the ideas of Web content mining with Web structure mining. The method was tested in the WiMAX sector of the telecommunication industry. Specifically, the keyword WiMAX was incorporated into queries that searched for co-links to pairs of company Websites. Two sets of data were collected: one with the proposed method and one with co-link search alone. The resulting two data matrices were analyzed using multidimensional scaling (MDS) to generate maps of business competition. The comparison between the two maps shows that the proposed method produced a map focusing on the WiMAX sector. The study also proposed the measure of reduction of co-link count that can be used to gauge the effectiveness of focusing the analysis on a particular sector. The reduction of co-link count could also be an easy and pragmatic measure for an analysis of a company’s competitiveness in a particular market segment.

Keywords: Analysis, Business, Comparison, Competition, Competitive, Data, Effectiveness, Intelligence, Mapping, Market, MDS, Measure, Mining, Multidimensional, Multidimensional Scaling, Reduction, Scaling, Sector, Structure, Web

? Yoo, S.H. and Moon, H.S. (2008), A note on approximation of distribution function for the number of innovation activities. *Scientometrics*, **77** (3), 445-452.

Full Text: [2008\Scientometrics77, 445.pdf](2008/Scientometrics77,%20445.pdf)

Abstract: This note attempts to approximate the distribution function for the number of innovation activities (NIA) in the manufacturing sector using the dataset of 2002 Korean Innovation Survey. The mixture model applied here can easily capture the bimodality feature of the NIA distribution and provide some useful information such as the mean of NIA and the effect of a firm’s characteristic on whether the firm will undertake innovation activity.

Keywords: Behavior, Distribution, Feature, Firms, Function, Information, Innovation, Korean, Manufacturing, Manufacturing-Industry, Model, Research-and-Development, Sector, Technological Innovation

? Barrios, M., Borrego, A., Vilagines, A., Olle, C. and Somoza, M. (2008), A bibliometric study of psychological research on tourism. *Scientometrics*, **77** (3), 453-467.

Full Text: [2008\Scientometrics77, 453.pdf](2008/Scientometrics77,%20453.pdf)

Abstract: The psychology of tourism is a new, multidisciplinary research field. However, no systematic analyses of the scientific production in this field have been carried out to date. This study presents a bibliometric analysis of the area of psychology of tourism between 1990 and 2005. The evolution of scientific production during this period, Price’s, Lotka’s and Bradford’s laws and citation patterns were studied. The results show a significant growth in the literature on the subject, as well as an increase in coauthorship and institutional collaboration. Bibliometric laws and empiric regularities observed in other disciplines are also present in this new research field.

Keywords: Analyses, Analysis, Articles, Authored Papers, Bibliometric, Bibliometric Analysis, Bibliometric Study, Citation, Citation Patterns, Citedness, Coauthorship, Collaboration, Evolution, Field, Growth, Impact, Laws, Literature, Lotka Law, Multidisciplinary, Patterns, Production, Psychology, Quality, Research, Scientific Collaboration, Scientific Production, Social-Sciences, Tourism

? Villarroya, A., Barrios, M., Borrego, A. and Frias, A. (2008), PhD theses in Spain: A gender study covering the years 1990-2004. *Scientometrics*, **77** (3), 469-483.

Full Text: [2008\Scientometrics77, 469.pdf](2008/Scientometrics77,%20469.pdf)

Abstract: In this study we analyse gender equality in the preparation, supervision and defence of PhD theses in Spain in the period 1990-2004. The results indicate a tendency towards greater equality in the number of men and women successfully completing doctoral studies. However, the gender imbalance among thesis supervisors and on thesis assessment boards is more apparent, with a predominance of male academics. Moreover, the gender of the PhD student is clearly related to the gender of the supervisor, and both are related to the gender of the members of the assessment boards of PhD theses in Spain.

Keywords: Assessment, Careers, Equality, Gender, Impact, Male, Matter, Men, Preparation, Productivity, Science, Social Origin, Spain, Student, Students, Supervision, Universalism, University, Women, Women Scientists

? Jarneving, B. (2008), A variation of the calculation of the first author cocitation strength in author cocitation analysis. *Scientometrics*, **77** (3), 485-504.

Full Text: [2008\Scientometrics77, 485.pdf](2008/Scientometrics77,%20485.pdf)

Abstract: The method of author cocitation analysis (ACA) was first presented by White and Griffith in 1981 as a “literature measure of intellectual structure” and its applicability for the mapping of areas of science has since then been tested in various bibliometric science mapping studies. In this study, an experimental method of calculating the first or single author cocitation frequency is presented and compared with the standard method. Applying Ward’s method of clustering, the analysis revealed that the two approaches did not produce similar results and a tentative interpretation of deviations was that the experimental method provided with a more detailed depiction of the specialty structure. It was also concluded that a number of additional research questions need to be resolved before a comprehensive understanding of the suggested method’s merits and demerits is reached.

Keywords: Analysis, Author Cocitation Analysis, Bibliometric, Calculation, Clustering, Cocitation, Experimental, First, Intellectual Structure, Mapping, Measure, Research, Retrieval, Science, Science Mapping, Specialty, Standard, Strength, Structure, Understanding, White

? Vanclay, J.K. (2009), Bias in the journal impact factor. *Scientometrics*, **78** (1), 3-12.

Full Text: [2009\Scientometrics78, 3.pdf](2009/Scientometrics78,%203.pdf)

Abstract: The ISI journal impact factor (JIF) is based on a sample that may represent half the whole-of-life citations to some journals, but a small fraction (<10%) of the citations accruing to other journals. This disproportionate sampling means that the JIF provides a misleading indication of the true impact of journals, biased in favour of journals that have a rapid rather than a prolonged impact. Many journals exhibit a consistent pattern of citation accrual from year to year, so it may be possible to adjust the JIF to provide a more reliable indication of a journal’s impact.

Keywords: Citation, Citations, Impact, Impact Factor, Indication, Isi, Journal, Journal Impact, Journal Impact Factor, Journals, Pattern, Prolonged, Sampling, Small, System

? Buranathiti, T., Premkamolnetr, N., Markpin, T., Ratchatahirun, P., Yochai, W. and Sombatsompop, N. (2009), Redistributed random sampling method for categorizing materials research publications from SCI database: Metallurgy and polymer subfields. *Scientometrics*, **78** (1), 13-21.

Full Text: [2009\Scientometrics78, 13.pdf](2009/Scientometrics78,%2013.pdf)

Abstract: This article introduced two sampling methods, including Directly Random Sampling (DRS) and Redistributed Random Sampling (RRS) methods for categorization of a large number of research articles retrieved from metallurgy and polymer subfields from the Science Citation Index (SCI) database. The accuracy of the proposed sampling methods was considered in association by comparing with reference results previously obtained by Fully Retrieving Sampling (FRS) method, which involved analyzing the contents and categories of all articles from the database. The results suggested that RRS and DRS methods were appropriate, efficient and reasonably accurate for categorization of relatively large volume of research articles. RRS method was highly recommended, especially when the contents of sample articles was unevenly distributed. By DRS and RRS methods, only about 6.3% of total articles were required for obtaining similar results as those given by FRS method. The percentage Expected Worst Errors (EWE) from DRS and RRS methods were observed to range from 1.0 to 5.5%. The EWE value could be reduced by increasing the sample size.

Keywords: Accuracy, Association, Citation, Database, Distributed, Drs, Ewe, Methods, Polymer, Publications, Reference, Research, Research Publications, Sample Size, Sampling, Sampling Methods, SCI, Science, Science Citation Index, Size, Value, Volume

? Leydesdorff, L. and Wagner, C. (2009), Is the United States losing ground in science? A global perspective on the world science system. *Scientometrics*, **78** (1), 23-36.

Full Text: [2009\Scientometrics78, 23.pdf](2009/Scientometrics78,%2023.pdf)

Abstract: Based on the Science Citation Index-Expanded web-version, the USA is still by far the strongest nation in terms of scientific performance. Its relative decline in percentage share of publications is largely due to the emergence of China and other Asian nations. In 2006, China has become the second largest nation in terms of the number of publications within this database. In terms of citations, the competitive advantage of the American “domestic market” is diminished, while the European Union (EU) is profiting more from the enlargement of the database over time than the USA. However, the USA is still outperforming all other countries in terms of highly cited papers and citation/publication ratios, and it is more successful than the EU in coordinating its research efforts in strategic priority areas like nanotechnology. In this field, the People’s Republic of China (PRC) has become second largest nation in both numbers of papers published and citations behind the USA.

Keywords: American, Asian, Bibliometric Assessment, Centrality, China, Citation, Citations, Competitive, Database, Delineation, Emergence, Enlargement, EU, European Union, Field, Indicators, Nanoscience, Nanotechnology, Nations, Papers, People’s Republic of China, Performance, Publications, Research, Science, Scientific Performance, Strategic, Technology, Terms, UK Scientific Performance, United States, USA, World

? Inzelt, A., Schubert, A. and Schubertc, M. (2009), Incremental citation impact due to international co-authorship in Hungarian higher education institutions. *Scientometrics*, **78** (1), 37-43.

Full Text: [2009\Scientometrics78, 37.pdf](2009/Scientometrics78,%2037.pdf)

Abstract: International co-authorship is generally thought and often found to have positive effects on the citation rate of scientific publications. We study the effect quantitatively in the example of four major and four medium Hungarian universities. The conclusions may be generalized to other countries of similar international status.

Keywords: Articles, Bibliometric Analysis, Citation, Co-Authorship, Coauthorship, Collaboration, Education, Effects, Higher Education, Impact, Institutions, International, Molecular-Biology, Publications, Scientific Cooperation, Scientific Publications, Status, Universities

? Levitt, J.M. and Thelwall, M. (2009), The most highly cited Library and Information Science articles: Interdisciplinarity, first authors and citation patterns. *Scientometrics*, **78** (1), 45-67.

Full Text: [2009\Scientometrics78, 45.pdf](2009/Scientometrics78,%2045.pdf)

Abstract: Highly cited articles are interesting because of the potential association between high citation counts and high quality research. This study investigates the 82 most highly cited Information Science and Library Science’ (IS&LS) articles (the top 0.1%) in the Web of Science from the perspectives of disciplinarity, annual citation patterns, and first author citation profiles. First, the relative frequency of these 82 articles was much lower for articles solely in IS&LS than for those in IS&LS and at least one other subject, suggesting that that the promotion of interdisciplinary research in IS&LS may be conducive to improving research quality. Second, two thirds of the first authors had an h-index in IS&LS of less than eight, show that much significant research is produced by researchers without a high overall IS&LS research productivity. Third, there is a moderate correlation (0.46) between citation ranking and the number of years between peak year and year of publication. This indicates that high quality ideas and methods in IS&LS often are deployed many years after being published.

Keywords: Association, Authors, Citation, Citation Counts, Citation Patterns, Correlation, First, h Index, h-Index, Interdisciplinary, Interdisciplinary Research, Methods, Potential, Productivity, Profiles, Promotion, Publication, Quality, Ranking, Research, Research Productivity, Research Quality, Researchers, Sleeping Beauties, Web of Science

? Sternitzke, C. (2009), Technological specialization and patenting strategies in East Asia - Insights from the electronics industry. *Scientometrics*, **78** (1), 69-76.

Full Text: [2009\Scientometrics78, 69.pdf](2009/Scientometrics78,%2069.pdf)

Abstract: We elicit filing strategies for patent families in China and Japan in two prominent technology fields: telecommunications and audiovisual technology. For the two destination countries we find substantial heterogeneity in filing strategies among applications from different countries. This heterogeneity cannot be explained with activities in technological subfields.

Keywords: Asia, China, East Asia, Families, Heterogeneity, Japan, Patent, Technology

? Prakasan, E.R., Kalyane, V.L. and Kumar, V. (2009), Sustained impact of publications of CV Raman. *Scientometrics*, **78** (1), 77-97.

Full Text: [2009\Scientometrics78, 77.pdf](2009/Scientometrics78,%2077.pdf)

Abstract: C.V. Raman is being acknowledged by worldwide physics community for his classic works. The present study has made an effort to analyze how much impact in number of citation receiving for his publications. Of course, there was a lack of tools for such a study some years back. The study has limited to the database Science Citation Index for the period 1982-2005. The noteworthy results are: One third of his research papers have been cited at least once, The research papers published during 1918-1940 could make remarkable impact, Three of his papers have shown an upward growth in number of citations receiving, The total citations to papers of age 46 and 54 as on the year 1982 accounted for more than 50 per cent of the total citations received, Research works in the ‘Acoustics’ area have been cited more than any other area of his works, Eponymal citations are to be explored and analysed to understand the real impact of his works.

Keywords: Age, Citation, Citations, Community, Course, CV, Database, Growth, Impact, Papers, Publications, Raman, Research, Science Citation Index

? Szydlowski, M. and Krawiec, A. (2009), Growth cycles of knowledge. *Scientometrics*, **78** (1), 99-111.

Full Text: [2009\Scientometrics78, 99.pdf](2009/Scientometrics78,%2099.pdf)

Abstract: We have developed a way of describing the increase with time of the number of papers in a scientific field and apply it to a data base of about 2000 papers on symbolic logic published between 1666 and 1934. We find (a) a general exponential increase in the cumulative total number of papers, (b) oscillations around this due to the appearance of new ideas in the field and the time required for their full incorporation, and (c) exogenously caused fluctuations due to wars and other non-scientific events.

Keywords: Cumulative, Cycles, Data, Data Base, Events, Field, General, Growth, Incorporation, Knowledge, Logic, Mathematical Approach, Model, Papers, Science

? Sternitzke, C. and Bergmann, I. (2009), Similarity measures for document mapping: A comparative study on the level of an individual scientist. *Scientometrics*, **78** (1), 113-130.

Full Text: [2009\Scientometrics78, 113.pdf](2009/Scientometrics78,%20113.pdf)

Abstract: This paper investigates the utility of the Inclusion Index, the Jaccard Index and the Cosine Index for calculating similarities of documents, as used for mapping science and technology. It is shown that, provided that the same content is searched across various documents, the Inclusion Index generally delivers more exact results, in particular when computing the degree of similarity based on citation data. In addition, various methodologies such as co-word analysis, Subject-Action-Object (SAO) structures, bibliographic coupling, co-citation analysis, and self-citation links are compared. We find that the two former ones tend to describe rather semantic similarities that differ from knowledge flows as expressed by the citation-based methodologies.

Keywords: Algorithm, Analysis, Bibliographic Coupling, Citation, Co-Citation, Co-Citation Analysis, Co-Word Analysis, Cocitation, Comparative Study, Data, Knowledge, Mapping, Methodologies, Science, Science and Technology, Self-Citation, Similarity, Technology, Utility

? Pouris, A. (2009), Fluorine research in South Africa and four benchmarking countries: Comparative mapping and assessment. *Scientometrics*, **78** (1), 131-143.

Full Text: [2009\Scientometrics78, 131.pdf](2009/Scientometrics78,%20131.pdf)

Abstract: Fluorine research has been identified as a priority area in South Africa and the South African Nuclear Energy Corporation (NECSA) is embarking in an effort to expand its hydrogen fluoride and aluminium trifluoride production capacity. On the eve of those efforts this article reports the findings of an effort to map and assess fluorine research in South Africa in comparison to four other countries i.e. Malaysia, Australia, Germany and Italy. The results of the assessment are aimed at guiding future directions for fluorine research in the country, at identifying centres of expertise nationally where new research chairs could be established, at identifying international centres of expertise to be utilised for collaboration and of course for inter-temporal benchmarking of fluorine research in South Africa. South Africa is identified to be producing a small number of fluorine research publications in comparison to other countries like Germany and Italy which produce orders of magnitude larger number of publications and in comparison to country’s total research effort. Furthermore the relevant research effort appears to be dispersed geographically and in disciplinary terms. Relevant recommendations are provided with particular emphasis on the pluralistic science policy approach followed in the country.

Keywords: Africa, African, Aluminium, Approach, Assessment, Australia, Benchmarking, Capacity, Chemistry, Collaboration, Comparison, Country, Course, Fluoride, Fluorine, Germany, Hydrogen, International, Italy, Malaysia, Mapping, Policy, Production, Publications, Recommendations, Research, Research Publications, Science, Science Policy, Small, South Africa

? Rigby, J. (2009), Comparing the scientific quality achieved by funding instruments for single grant holders and for collaborative networks within a research system: Some observations. *Scientometrics*, **78** (1), 145-164.

Full Text: [2009\Scientometrics78, 145.pdf](2009/Scientometrics78,%20145.pdf)

Abstract: Increasingly, funding of academic research is carried out through the support of collaboration, rather than through single awards to a sole grant holder. The practice is well supported by evidence that larger, network-based research achieves high quality while leading to a number of capacity building benefits for the research system, although with significant transaction costs. However, the question of what kind of funding schemes should be made available to researchers is not a simple dichotomy between single grant-holder projects and networks. A key question is how to achieve a balance in each subject field between different forms of funding instrument employed while ensuring different forms of funding retain a reputation for generating research of high scientific quality. This paper reports the results of a systematic comparison of the scientific quality of 1010 scientific papers from the ISI database produced under two contrasting forms of funding instrument for a single year in the Austrian science system. Comparison of the arcsinh transformed citation counts of papers from the two main forms of funding for basic science at the level of main scientific field shows there is no statistically significant difference in the quality achieved by the two forms of funding. This may suggest that funders and research performers have succeeded in ensuring that different research instruments nevertheless achieve very similar levels of scientific excellence.

Keywords: Academic, Benefits, Building, Capacity, Capacity Building, Citation, Citation Counts, Collaboration, Comparison, Costs, Cross-Disciplinary, Database, Evidence, Field, Forms, Funding, Impact, International Collaboration, ISI, ISI Database, Networks, Papers, Practice, Quality, Quality of, Research, Research Productivity, Science, Support, Transaction Costs, Transformation

? Glänzel, W., Thijs, B., Schubert, A. and Debackere, K. (2009), Subfield-specific normalized relative indicators and a new generation of relational charts: Methodological foundations illustrated on the assessment of institutional research performance. *Scientometrics*, **78** (1), 165-188.

Full Text: [2009\Scientometrics78, 165.pdf](2009/Scientometrics78,%20165.pdf)

Abstract: A common problem in comparative bibliometric studies at the meso and micro level is the differentiation and specialisation of research profiles of the objects of analysis at lower levels of aggregation. Already the institutional level requires the application of more sophisticated techniques than customary in evaluation of national research performance. In this study institutional profile clusters are used to examine which level of the hierarchical subject-classification should preferably be used to build subject-normalised citation indicators. It is shown that a set of properly normalised indicators can serve as a basis of comparative assessment within and even among different clusters, provided that their profiles still overlap and such comparison is thus meaningful. On the basis of 24 selected European universities, a new version of relational charts is presented for the comparative assessment of citation impact.

Keywords: Aggregation, Analysis, Application, Assessment, Bibliometric, Bibliometric Indicators, Bibliometric Studies, Citation, Citation Impact, Classification, Comparison, Distributions, Evaluation, Generation, Impact, Indicators, Journals, National, Performance, Profiles, Reliability, Research, Research Performance, Science Fields, Scientific Publications, Techniques, Universities, Version

? Sternitzke, C. (2009), The international preliminary examination of patent applications filed under the Patent Cooperation Treaty - a proxy for patent value? *Scientometrics*, **78** (2), 189-202.

Full Text: [2009\Scientometrics78, 189.pdf](2009/Scientometrics78,%20189.pdf)

Abstract: One way to achieve international patent protection is to file patents via the Patent Cooperation Treaty (PCT). The application process therein can be divided into two phases, those represented by chapters I and II of the PCT. According to the literature, patent applications filed via chapter II of the Treaty tend to be more valuable. The results presented in this paper suggest that in general this assumption is not justified. The analyses further revealed that for practitioners seeking fast patent protection at the European Patent Office (EPO) via the PCT, the choice should be chapter II of the PCT, with the EPO as preliminary examination authority.

Keywords: Analyses, Application, Choice, Examination, General, Grants, Indicators, International, Literature, Opposition, Patent, Patents, Process, Protection, Value

? Bouabid, H. and Martin, B.R. (2009), Evaluation of Moroccan research using a bibliometric-based approach: Investigation of the validity of the h-index. *Scientometrics*, **78** (2), 203-217.

Full Text: [2009\Scientometrics78, 203.pdf](2009/Scientometrics78,%20203.pdf)

Abstract: This paper presents the results of an evaluation of the national research system in Morocco. The exercise focuses on the period 1997-2006 and includes a comparison with South Africa, Egypt, Nigeria, Tunisia, Algeria, Portugal and Greece. Ratings of highly ranked researchers are developed on the basis of their number of publications, number of citations and also their ‘h-index’ (or Hirsch index). Finally, we examine the empirical model set by Glänzel that related the h-index to the number of publications and the mean citation rate per paper for these ‘upper-class’ researchers. The use of this model confirms that the h-index is likely to reflect the importance and the quality of the scientific output of a given researcher.

Keywords: Africa, Algeria, Approach, Citation, Citations, Comparison, Egypt, Evaluation, Exercise, Greece, h Index, h-Index, Hirsch, Hirsch Index, Hirsch-Index, Index, Indicators, Investigation, Model, Morocco, National, Nigeria, Portugal, Publications, Quality, Quality Of, Research, Scientific Output, South Africa, Validity

? Neuhaus, C. and Daniel, H.D. (2009), A new reference standard for citation analysis in chemistry and related fields based on the sections of Chemical Abstracts. *Scientometrics*, **78** (2), 219-229.

Full Text: [2009\Scientometrics78, 189.pdf](2009/Scientometrics78,%20189.pdf)

Abstract: Citation analysis for evaluative purposes requires reference standards, as publication activity and citation habits differ considerably among fields. Reference standards based on journal classification schemes are fraught with problems in the case of multidisciplinary and general journals and are limited with respect to their resolution of fields. To overcome these shortcomings of journal classification schemes, we propose a new reference standard for chemistry and related fields that is based on the sections of the Chemical Abstracts database. We determined the values of the reference standard for research articles published in 2000 in the biochemistry sections of Chemical Abstracts as an example. The results show that citation habits vary extensively not only between fields but also within fields. Overall, the sections of Chemical Abstracts seem to be a promising basis for reference standards in chemistry and related fields for four reasons: (1) The wider coverage of the pertinent literature, (2) the quality of indexing, (3) the assignment of papers published in multidisciplinary and general journals to their respective fields, and (4) the resolution of fields on a lower level (e.g. mammalian biochemistry) than in journal classification schemes (e.g. biochemistry & molecular biology).

Keywords: Analysis, Biochemistry, Biology, Chemistry, Citation, Citation Analysis, Classification, Coverage, Database, General, Habits, Indexing, Indicators, Journal, Journals, Literature, Molecular, Molecular Biology, Multidisciplinary, Normalization, Online Databases, Output, Papers, Publication, Publication Activity, Quality, Quality of, Reference, Reference Standards, Research, Searches, Standard, Standards, Values

? Long, R., Crawford, A., White, M. and Davis, K. (2009), Determinants of faculty research productivity in information systems: An empirical analysis of the impact of academic origin and academic affiliation. *Scientometrics*, **78** (2), 231-260.

Full Text: [2009\Scientometrics78, 231.pdf](2009/Scientometrics78,%20231.pdf)

Abstract: This manuscript provides guidance to Deans and other academic decision makers in the hiring process and dispels the validity of a widely held assumption commonly used as a decision factor in the selection process. This paper investigates: (a) whether graduates of prestigious information systems (IS) doctoral programs (graduates with high-status academic origins) are more likely to be successful in their academic careers (as measured by research productivity) than graduates of less prestigious programs, (b) whether IS faculty who are employed by esteemed universities (faculty with high-status academic affiliations) are more productive researchers than IS faculty employed by lower-status institutions, and (c) examines faculty productivity in terms of Lotka’s Law [Lotka, 1926]. The findings indicate that in the IS field, productivity does not follow a Lotka distribution. Moreover, our study also shows that academic affiliation is a significant determinant of research productivity in terms of quantity (as measured by publication counts) and quality (as measured by citation counts). Contrary to common expectations, however, the analysis shows that the status of a faculty member’s academic origin is not a significant determinant of research productivity in the field of information systems. Therefore, continued reliance on academic pedigree as a primary criterion for hiring decisions may not be justified in the IS discipline.

Keywords: Academic, Affiliation, Analysis, Business Schools, Careers, Citation, Citation Analysis, Citation Counts, Decision, Distribution, Faculty, Field, Global Perceptions, Guidance, Hiring, Impact, Information, Information Systems, Institutions, Is, Leading Journals, Lotka, Management, Mis Research, Origin, Primary, Process, Productivity, Publication, Publication Counts, Publication Productivity, Quality, Research, Research Performance, Research Productivity, Scientific Productivity, Selection, Status, Systems, Theoretical Population-Genetics, Universities, Validity

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Full Text: [2009\Scientometrics78, 261.pdf](2009/Scientometrics78,%20261.pdf)

Abstract: As the major concerns of the university are teaching and research, this paper describes the study of a nation-wide evaluation of research performance in management for 168 universities in Taiwan. In addition to the popular indicators of SCI/SSCI journal publications and citations, the number of projects funded by the National Science Council of Taiwan was used to account for the special characteristic of the field of management. The evaluation was based on individual professors rather than management programs, so that all types of universities, including those without management departments, could be compared. Performances of each university in those three indicators were aggregated by a set of a posteriori weights which were most favourable to all universities in calculating the aggregated score. The results show that public universities, in general, performed better than private ones. Universities with specific missions had comparable performance to general comprehensive ones. Analyses from a set of a priori weights solicited from experts showed that the results of this study are robust to the indicators selected and the weights used.

Keywords: Citations, Data Envelopment Analysis, Departments, Efficiency, Evaluation, Experts, Field, General, Indicators, Journal, Journal Evaluation, Libraries, Management, Performance, Public, Publications, Research, Research Performance, Taiwan, Teaching, Universities, University, Weights

? Tsay, M.Y. (2009), An analysis and comparison of scientometric data between journals of physics, chemistry and engineering. *Scientometrics*, **78** (2), 279-293.

Full Text: [2009\Scientometrics78, 279.pdf](2009/Scientometrics78,%20279.pdf)

Abstract: By employing the Pearson correlation, Fisher-and t-tests, the present study analyzes and compares scientometric data including number of source items, number of citations, impact factor, immediacy index, citing half-life and cited half-life, for essential journals in physics, chemistry and engineering, from SCI JCR on the Web 2002. The results of the study reveal that for all the scientometric indicators, except the cited half-life, there is no significant mean difference between physics and chemistry subjects indicating similar citation behavior among the scientists. There is no significant mean difference in the citing half-life among the three subjects. Significant mean difference is generally observed for most of the scientometric indicators between engineering and physics (or chemistry) demonstrating the difference in citation behavior among engineering researchers and scientists in physics or chemistry. Significant correlations among number of source items, number of citations, impact factor, and immediacy index and between cited half-life and citing half-life generally prevail for each of the three subjects. On the contrary, in general, there is no significant correlation between the cited half-life and other scientometric indicators. The three subjects present the same strength of the correlations between number of source items and number of citations, between number of citations and impact factor, and between cited half-life and citing half-life.

Keywords: Analysis, Behavior, Chemistry, Citation, Citations, Cited Half-Life, Comparison, Correlation, Correlations, Data, Engineering, General, Half-Life, Immediacy Index, Impact, Impact Factor, Index, Indicators, Journals, SCI, Scientometric, Source, Strength

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Full Text: [2009\Scientometrics78, 295.pdf](2009/Scientometrics78,%20295.pdf)

Abstract: The paper reviews the present status of Indian physics research, in particular its nature of research system, nature of institutions involved, type of education offered and outturn at postgraduate and Ph.D level, the extent to which extra-mural funding support is available from various governmental R&D agencies, and the nature of professional organizations involved. The study is based on analysis of Indian physics output, as indexed in Expanded Science Citation Index (Web of Science) during 1993-2001. The study also discusses various features of Indian physics research such as its growth in terms of research papers, institutional publication productivity, nature of collaboration, and the quality and impact of its research output.

Keywords: Analysis, China, Citation, Citation Patterns, Collaboration, Education, Funding, Growth, Impact, India, Indian, Institutions, Laser Research, Macro, Papers, Productivity, Publication, Quality, Research, Reviews, Science, Science Citation Index, Scientometrics, Status, Support, Technology, Type of Education, Web of Science

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Full Text: [2009\Scientometrics78, 317.pdf](2009/Scientometrics78,%20317.pdf)

Abstract: In restructuring environmental research organisations, smaller sites generally disappear and larger sites are created. These decisions are based on the economic principle, ‘economies of scale’, whereby the average cost of each unit produced falls as output increases. We show that this principle does not apply to the scientific performance of environmental research institutes, as productivity per scientist decreased with increasing size of a research site. The results are best explained by the principle ‘diseconomies of scale’, whereby powerful social factors limit the productivity of larger groupings. These findings should be considered when restructuring environmental science organisations to maximise their quality.

Keywords: Cost, Economic, Economics, Environmental, Environmental Research, Environmental Science, Law, Performance, Planned Behavior, Productivity, Quality, Reasoned Action, Research, Scale, Science, Scientific Performance, Site, Size, Social, Social Factors

? Gossart, C. and Ozman, M. (2009), Co-authorship networks in social sciences: The case of Turkey. *Scientometrics*, **78** (2), 323-345.

Full Text: [2009\Scientometrics78, 323.pdf](2009/Scientometrics78,%20323.pdf)

Abstract: We analyse the co-authorship networks of researchers affiliated at universities in Turkey by using two databases: the international SSCI database and the Turkish ULAKBIM database. We find that co-authorship networks are composed largely of isolated groups and there is little intersection between the two databases, permitting little knowledge diffusion. There seems to be two disparate populations of researchers. While some scholars publish mostly in the international journals, others target the national audience, and there is very little intersection between the two populations. The same observation is valid for universities, among which there is very little collaboration. Our results point out that while Turkish social sciences and humanities publications have been growing impressively in the last decade, domestic networks to ensure the dissemination of knowledge and of research output are very weak and should be supported by domestic policies.

Keywords: Co-Authorship, Co-Authorship Networks, Coauthorship, Collaboration, Cooperation, Database, Databases, Diffusion, Humanities, International, Journals, Knowledge, Knowledge Diffusion, Localization, National, Networks, Observation, Patterns, Policies, Populations, Profiles, Publications, Research, Research Collaboration, Sciences, Self-Organization, Social, Social Sciences, SSCI, Turkey, Turkish, Universities

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Full Text: [2009\Scientometrics78, 189.pdf](2009/Scientometrics78,%20189.pdf)

Abstract: The relative occurrence of the words “surprising” and “unexpected” in the titles of scientific papers was 11 times more common in 2001-2005 than in 1900-1955. However, papers which had titles containing one of these words did not receive enhanced numbers of citations. Both words (and also adjectives “unusual” and “unfortunately”) are used significantly more frequently in science than in social sciences and humanities. The distribution of the statements of surprise is not random in scientific literature (chemistry journals ranked highest in the number of papers claiming “surprising” or “unexpected” results) and may reflect the level of maturity of a discipline.

Keywords: Challenge, Chemistry, Citations, Discovery, Distribution, Humanities, Index, Journals, Literature, Media, Papers, Science, Sciences, Scientific Literature, Social, Social Sciences

? Glänzel, W. (2009), The multi-dimensionality of journal impact. *Scientometrics*, **78** (2), 355-374.

Full Text: [2009\Scientometrics78, 355.pdf](2009/Scientometrics78,%20355.pdf)

Abstract: In recent studies the issue of the relatedness between journal impact factors and other measures of journal impact have been raised and discussed from both merely empirical and theoretical perspectives. Models of the underlying citation processes suggest distributions with two or more free parameters. Proceeding from the relation between the journals’ mean citation rate and uncitedness and the assumption of an underlying Generalised Waring Distribution (GWD) model, it is found that the journal impact factor alone does not sufficiently describe a journal’s citation impact, while a two-parameter solution appropriately reflects its main characteristics. For the analysis of highly cited publications an additional model derived from the same GWD is suggested. This approach results in robust, comprehensible and interpretable solutions that can readily be applied in evaluative bibliometrics.

Keywords: Analysis, Approach, Bibliometrics, Characteristics, Citation, Citation Impact, Generalized Waring Distribution, Impact, Impact Factor, Impact Factors, Index, Journal, Journal Impact, Journal Impact Factor, Journal Impact Factors, Journals, Model, Models, Publications, Scientific Literature, Skew Distributions, Solution, Solutions, Stochastic-Model, Uncitedness

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Full Text: [2009\Scientometrics78, 375.pdf](2009/Scientometrics78,%20375.pdf)

Abstract: Hirsch-type indices are devised for characterizing networks and network elements. Their actual use is demonstrated on scientometric examples, and the potential value of the concept on a practically unlimited range of networks is suggested.

Keywords: h-Index, Indices, Journals, Network, Networks, Potential, Scientometric, Value

? Valles-Valenzuela, J., Perez-Carceles, M.D., Osuna, E. and Luna, A. (2009), Quantitative analysis of Spanish university scientific output in the area of Legal and Forensic Medicine: International exposure. *Scientometrics*, **78** (3), 383-395.

Full Text: [2009\Scientometrics78, 383.pdf](2009/Scientometrics78,%20383.pdf)

Abstract: We set out to analyse and quantify the papers published (for an international readership) by Spanish universities in the field of Legal and Forensic Medicine. For this, we used the MEDLINE data base, to analyse research articles in which a Spanish university teacher (whose sole employment was with a university, as registered by the Ministry of Education in July 2005, (n = 67), appeared as author or co-author in this field. The years covered are 1952 (First year that a Spanish author appears for an article on Legal and Forensic Medicine in this service) to July 2005. A total of 770 articles were counted, the productivity in this area was increasing substantially from the 1980’s onwards. English language scientific journals were the preferred channel of communication. Slightly more than 85% of the works can be classified into four themes, of which Genetics is the most prolific. The number of papers published in English journals represented 84% of the total and only 13% was published in Spanish journals. There was a close relationship between growth in the authority index and inter-institutional co-operation, which boosted the production of articles. When at least one of the authorship of a published paper was a Spanish university teacher, the research was led by a university in 62.4% of cases, and of this 85.6% were Spanish universities.

Keywords: Analysis, Authority, Authors, Authorship, Co-Author, Communication, Cooperation, Data, Data Base, Employment, Exposure, Field, Growth, Index, International, Journals, Language, Mar, Medline, Papers, Production, Productivity, Research, Scientific Journals, Scientific Output, Service, Spain, Spanish, Spanish Journals, Universities, University

? Kao, C. (2009), The authorship and country spread of Operation Research journals. *Scientometrics*, **78** (3), 397-407.

Full Text: [2009\Scientometrics78, 397.pdf](2009/Scientometrics78,%20397.pdf)

Abstract: This paper surveys 56 internationally renowned OR journals published in 1996-2005 with regard to authorship. Our findings show that the USA was the country that contributed the largest amount, approximately one-third, of research results to OR journals. Authors tend to publish papers in their home-country journals. Journal of the Operations Research Society of Japan has the highest author concentration, with more than 85% of the authors from Japan and European Journal of Operational Research, on the contrary, has the widest country spread of its authors. The entropy measure provides a whole picture of the share of all countries, based on which the editorial policy of a journal can be adjusted.

Keywords: Authors, Authorship, Citation Patterns, Concentration, Country, Entropy, Flagship Journals, Japan, Journal, Journals, Mar, Measure, OR, MS, Papers, Policy, Research, Research Results, Surveys, USA

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Full Text: [2009\Scientometrics78, 409.pdf](2009/Scientometrics78,%20409.pdf)

Abstract: Most studies of scholarly influence within disciplines using citation data do not investigate the extent of an individual’s influence, does it extend over a number of years with a sequence of publications or is it confined to a short period and a small number of publications? Using bibliographic data from a series of quadrennial reports into developments in UK geography, this paper finds that few authors are cited on more than one occasion.

Keywords: Alternative, Approach, Authors, Citation, Data, Influence, International Geographical Congress, Literature, Mar, Publications, Small, UK, United-Kingdom

? Yang, H. (2009), The top 40 citation classics in the Journal of the American Society for Information Science and Technology. *Scientometrics*, **78** (3), 421-426.

Full Text: [2009\Scientometrics78, 421.pdf](2009/Scientometrics78,%20421.pdf)

Abstract: This study used citation analysis method to identify the 40 classics published in the Journal of the American Society for Information Science and Technology from 1956 to 2007. Yhe year and subject distributions of these classic references reflect the history and the current status of information science.

Keywords: American, Analysis, Citation, Citation Analysis, Citation Classics, History, Information, Information Science, Jasis, MAR, References, Science, Status

? Zimmerman, E., Glänzel, W. and Bar-Ilan, J. (2009), Scholarly collaboration between Europe and Israel: A scientometric examination of a changing landscape. *Scientometrics*, **78** (3), 427-446.

Full Text: [2009\Scientometrics78, 427.pdf](2009/Scientometrics78,%20427.pdf)

Abstract: In this paper we examine various aspects of the scientific collaboration between Europe and Israel, and show that the traditional collaboration patterns of Israel (preference towards collaboration with the US) is changing, and the collaboration with the EU countries is growing.

Keywords: Co-Authorship, Collaboration, EU, Europe, Examination, Indicators, Israel, Landscape, MAR, Preference, Science Fields, Scientific Collaboration, Scientometric, US

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Full Text: [2009\Scientometrics78, 447.pdf](2009/Scientometrics78,%20447.pdf)

Abstract: Median age difference (D) is obtained by subtracting median value of the age distribution of references of a scientific paper from citing half life of the journal that published it. Such an indicator can be related to the state of knowledge of research groups and can show some interesting properties: 1) it must be related with the incorporation of information pieces in an informal way, say the rate of self-citations, 2) it must follow the natural tendency of the groups towards a progressively updated state of knowledge, and 3) more productive groups will tend to use more recent information. These natural hypotheses have been investigated using a medium sized Spanish institution devoted to Food Research as a case study. Scientific output comprised 439 papers published in SCI journals between 1999 and 2004 by 16 research teams. Their 14,617 references were analyzed. Variables studied were number of published papers by every team, number of authors per paper, number of references per paper, type of documents cited, self citation rate and chronological range of reference lists. Number of authors per paper ranged between 1 and 15. The most frequent value (N = 128) was 3 authors. Average number of authors per paper is 4.03 (SD = 1.74). Mean number of references per paper (including review papers) is 33.3 (SD= 17.39) with slight differences between the groups. Mean self-citation rate was 13.72 % (SD = 11.7). The greatest chronological range was 119 years, half of all ranges was 30 years and the general mean for this variable was 33.34 years (SD = 16.34). D values were associated with self-citation rate and a negative relationship between D and chronological range of references was also found. Nevertheless, correlation figures were too small to reach sound conclusions about the effect of these variables. Number of references per paper, number of contributing authors and number of papers published by each team were not associated with D. D values can discriminate between groups managing updated information and delayed research teams. Publication delay affects D figures. Discontinuity of research lines, heterogeneity of research fields and the short time lapse studied could have some influence on the results of the study. It is suggested that a great coverage is needed to evaluate properly D figures as indicators of information update of research groups.

Keywords: Age, Authors, Case Study, Citation, Correlation, Coverage, Delay, Distribution, Food, General, Half-Life, Heterogeneity, Incorporation, Indicator, Indicators, Influence, Informal, Information, Journal, Journals, Knowledge, Life, MAR, N, Natural, Papers, Reference, Reference Lists, References, Research, Review, SCI, Science, Self, Self-Citation, Self-Citations, Small, Spanish, State, Value, Values

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Full Text: [2009\Scientometrics78, 467.pdf](2009/Scientometrics78,%20467.pdf)

Abstract: We have developed a method to obtain robust quantitative bibliometric indicators for several thousand scientists. This allows us to study the dependence of bibliometric indicators (such as number of publications, number of citations, Hirsch index...) on the age, position, etc. of CNRS scientists. Our data suggests that the normalized h-index (h divided by the career length) is not constant for scientists with the same productivity but different ages. We also compare the predictions of several bibliometric indicators on the promotions of about 600 CNRS researchers. Contrary to previous publications, our study encompasses most disciplines, and shows that no single indicator is the best predictor for all disciplines. Overall, however, the Hirsch index h provides the least bad correlations, followed by the number of papers published. It is important to realize however that even h is able to recover only half of the actual promotions. The number of citations or the mean number of citations per paper are definitely not good predictors of promotion.

Keywords: Age, Bibliometric, Bibliometric Indicators, Citation, Citations, Correlations, Data, Dependence, h Index, h-Index, Hirsch, Hirsch Index, Index, Index h, Indicator, Indicators, Length, MAR, Papers, Prediction, Predictions, Predictors, Productivity, Promotion, Publications, Single Indicator

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Full Text: [2009\Scientometrics78, 481.pdf](2009/Scientometrics78,%20481.pdf)

Abstract: To discover the current situation and characteristics of web reference accessibility, the present study examined the accessibility of 1,637 web references in two key Chinese academic journals published from 1999 to 2003. The author develops linear regression models to demonstrate the decay of web reference accessibility. The study examines the influence of high use of web references in a paper, the associations between web reference accessibility and generic domain, country domain, protocol, and resource type, respectively, and classifies inaccessible web references according to Internet Explorer feedbacks. It compares the retrieval efficacy among three kinds of retrieval methods and reports on the limitations of Internet Archive.

Keywords: Academic, Characteristics, Chinese, Country, Decay, Efficacy, Influence, Internet, Internet Citations, Journals, Linear Regression, Linear-Regression, Link, MAR, Methods, Models, Page, Permanence, Persistence, Reference, References, Regression, Resource, Stability, Time, Urls, Web

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Full Text: [2009\Scientometrics78, 505.pdf](2009/Scientometrics78,%20505.pdf)

Abstract: A socio-economic networking (SEN) of the public funded basic research (PFBR) in the Japan Atomic Energy Research Institute (JAERI) was studied by the bibliometric method combined with the international nuclear database INIS. As PFBR, Material Science (MS) research of JAERI is chosen. The appropriateness of the present bibliometric method is discussed. The authors believe that this method is applicable to studying the socio-economic effect on PFBR. The shortcoming of it is, however, the use of the inevitable usage of biased EBRF (ranked keywords), accompanied with the feeling of unfairness. The authors confirm that the S-matrix has a potential capability to show the quantitative magnitude of co-operation among research institutions avoiding significant bias.

Keywords: Authors, Bias, Bibliometric, Cooperation, Database, Effects, Energy, Institutions, International, Japan, MAR, MS, Potential, Public, Research, Science, Socioeconomic

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Full Text: [2009\Scientometrics78, 525.pdf](2009/Scientometrics78,%20525.pdf)

Abstract: This study examines the relationship between citation frequency and the human capital of teams of authors. Analysis of a random sample of articles published in top natural science journals shows that articles co-authored by teams including frequently cited scholars and teams whose members have diverse disciplinary backgrounds have greater citation frequency. The institutional prestige, the percentage of team members at U. S. institutions and the variety of disciplines represented by team member backgrounds do not influence citation frequency. The study introduces a method for evaluating the extent of multidisciplinarity that accounts for the relatedness of disciplines or authors.

Keywords: Articles, Authors, Citation, Citation Frequency, Human, Human Capital, Impact, Index, Influence, Institutions, Interdisciplinarity, Journals, MAR, Model, Multidisciplinarity, Natural, Patterns, Random Sample, Research Collaboration, Science, Science Journals, Scientific Teams, U, Universities

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Full Text: [2009\Scientometrics78, 543.pdf](2009/Scientometrics78,%20543.pdf)

Abstract: Optics is an important research domain both for its scientific interest and industrial applications. In this paper, we constructed a citation network of papers and performed topological clustering method to investigate the structure of research and to detect emerging research domains in optics. We found that optics consists of main five subclusters, optical communication, quantum optics, optical data processing, optical analysis and lasers. Then, we further investigated the detailed subcluster structures in it. By doing so, we detected some emerging research domains such as nonlinearity in photonic crystal fiber, broad band parametric amplifier, and in-vivo imaging techniques. We also discuss the distinction between research front and intellectual base in optics.

Keywords: Analysis, Approach, Bibliometric, Citation, Citation Network, Clustering, Communication, Companies, Constructed, Data, Growth, Imaging, Indicators, MAR, Network, Networks, Optics, Papers, Parametric, Photonic Crystal, Research, Research Front, Research Fronts, Science, Semiconductor Literature, Structure, Techniques, Technology, Tracking, Visualization

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Full Text: [2009\Scientometrics78, 559.pdf](2009/Scientometrics78,%20559.pdf)

Abstract: It is shown that a Hirsch-type index can be used for assessing single highly cited publications by calculating the h-index of the set of papers citing the work in question. This index measures not only the direct impact of a publication but also its indirect influence through the citing papers.

Keywords: Assessing, Citations, h Index, h-Index, Hirsch-Type Indexes, Impact, Index, Indicators, Influence, Journals, MAR, Papers, Publication, Publications, Work

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Full Text: [2009\Scientometrics79, 7.pdf](2009/Scientometrics79,%207.pdf)

Abstract: The World Wide Web is growing at an enormous speed, and has become an indispensable source for information and research. New pages are constantly added, but there are additional processes as well: pages are moved or removed and/or their content changes. We report here the results of an eight year long project started in 1998, when multiple search engines were used to identify a set of pages containing the term informetrics. Data collection was repeated once a year for the last eight years (with the exception of 2000 and 2001) using both search engines and revisiting previously identified pages. The results show that the number of pages grew from 866 in 1998 to 28,914 in 2006 - a 33-fold growth. Besides the obvious growth of the topic on the Web, we observed both decay (pages disappearing from the Web) and modification. Even though most of the pages from 1998 either disappeared or ceased to contain the term informetrics, 165 pages (19.1%) still exist in 2006 and contain the search term. We followed the “fate” of these 165 pages: characterized the publishers, the contents and the changes that occurred the whole period. In recent years e-print servers and publishers’ sites became sources of large number of pages related to informetrics. Longitudinal studies following the evolution of a topic on the Web are very important, since they provide insights about content and the underlying Web processes.

Keywords: Changes, Collection, Content, Decay, Evolution, Growth, Information, Informetrics, Lifespan, Link Rot, Modification, Pages, Persistence, References, Research, Search, Search Engines, Source, Sources, Speed, Term, World Wide Web

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Full Text: [2009\Scientometrics79, 27.pdf](2009/Scientometrics79,%2027.pdf)

Abstract: Research on the effects of collaboration in scientific research has been increasing in recent years. A variety of studies have been done at the institution and country level, many with an eye toward policy implications. However, the question of how to identify the most fruitful targets for future collaboration in high-performing areas of science has not been addressed. This paper presents a method for identifying targets for future collaboration between two institutions. The utility of the method is shown in two different applications: identifying specific potential collaborations at the author level between two institutions, and generating an index that can be used for strategic planning purposes. Identification of these potential collaborations is based on finding authors that belong to the same small paper-level community (or cluster of papers), using a map of science and technology containing nearly 1 million papers organized into 117,435 communities. The map used here is also unique in that it is the first map to combine the ISI Proceedings database with the Science and Social Science Indexes at the paper level.

Keywords: Authors, Cluster, Collaboration, Collaborations, Communities, Community, Country, Database, Effects, First, Index, Institution, Institutions, ISI, Papers, Planning, Policy, Potential, Research, Science, Science and Technology, Scientific Research, Small, Strategic, Strategic Planning, Technology, Utility

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Full Text: [2009\Scientometrics79, 45.pdf](2009/Scientometrics79,%2045.pdf)

Abstract: How does our collective scholarly knowledge grow over time? What major areas of science exist and how are they interlinked? Which areas are major knowledge producers, which ones are consumers? Computational scientometrics - the application of bibliometric/scientometric methods to large-scale scholarly datasets - and the communication of results via maps of science might help us answer these questions. This paper represents the results of a prototype study that aims to map the structure and evolution of chemistry research over a 30 year time frame. Information from the combined Science (SCIE) and Social Science (SSCI) Citations Indexes from 2002 was used to generate a disciplinary map of 7,227 journals and 671 journal clusters. Clusters relevant to study the structure and evolution of chemistry were identified using JCR categories and were further clustered into 14 disciplines. The changing scientific composition of these 14 disciplines and their knowledge exchange via citation linkages was computed. Major changes on the dominance, influence, and role of Chemistry, Biology, Biochemistry, and Bioengineering over these 30 years are discussed. The paper concludes with suggestions for future work.

Keywords: Application, Changes, Chemistry, Citation, Citations, Collective, Communication, Composition, Consumers, Dominance, Evolution, Exchange, Influence, Journal, Journal Cocitation Analysis, Journals, Knowledge, Maps, Methods, Research, Role, Science, Science-Citation-Index, Scientometrics, Ssci, Structure, Time, Work

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Full Text: [2009\Scientometrics79, 61.pdf](2009/Scientometrics79,%2061.pdf)

Abstract: In this study some novel indicators and publication data resources are explored to study the dynamics of genomics research at three different levels: worldwide, national and at individual Research Centers. Our results indicate that the growth of genomics research worldwide seems to be stabilizing, whereas genomics research in the Netherlands aims at getting ‘ready for the next step’. As we find differences in research dynamics at the level of individual Research Centers, governmental support in a ‘next step’ could take these differences into account. For this purpose, we introduce a general model of research dynamics and timing of research management, building on ideas of Price and Bonaccorsi. Based on this model a framework is presented to discuss steering options in relation to research dynamics. We apply this framework to Research Centers of the Netherlands Genomics Initiative (NGI) and discuss findings.

Keywords: Building, Data, Dynamics, Framework, General, Genomics, Growth, Indicators, Management, Model, National, Netherlands, Options, Publication, Purpose, Research, Resources, Support, The Netherlands, Timing

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Full Text: [2009\Scientometrics79, 79.pdf](2009/Scientometrics79,%2079.pdf)

Abstract: In recent issues of the ISSI Newsletter, Egghe [2006a] proposed the g-index and Kosmulski [2006] the h(2)-index, both claimed to be improvements on the original h-index proposed by Hirsch [2005]. The aim of this paper is to investigate the inter-relationships between these measures and also their time dependence using the stochastic publication/citation model proposed by Burrell [1992, 2007a]. We also make some tentative suggestions regarding the relative merits of these three proposed measures.

Keywords: Dependence, G Index, G-Index, h Index, h-Index, Hirsch, Index, Model, Scientists, Stochastic, Time, Time Dependence

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Full Text: [2009\Scientometrics79, 93.pdf](2009/Scientometrics79,%2093.pdf)

Abstract: The purpose of this paper is to analyse the relationship between bureaucracy and research performance within Public Research Bodies. The research methodology is applied on a sample of 100 interviewed belonging to 11 institutes of National Research Council of Italy. The main finding is that within Italian Public Research Council there is academic bureaucratization that reduces performance and efficiency of institutes. In fact, institutes have two organizational behaviours: high bureaucracy - low performance and low bureaucracy - high performance. These bureaucratic tendencies are also present in other countries and particularly: the public research labs have an academic bureaucratization because of administrative burden necessary to the governance of the structures, whereas the universities have mainly an administrative bureaucratization generated by the increase of administrative staff in comparison with researchers and faculty.

Keywords: Academic, Burden, Bureaucracy, Comparison, Efficiency, Faculty, Governance, Italy, Methodology, Organizational, Performance, Public, Purpose, Red Tape, Relationship, Research, Research Methodology, Research Performance, Universities

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Full Text: [2009\Scientometrics79, 109.pdf](2009/Scientometrics79,%20109.pdf)

Abstract: A novel subject-delineation strategy has been developed for the retrieval of the core literature in bioinformatics. The strategy combines textual components with bibliometric, citation-based techniques. This bibliometrics-aided search strategy is applied to the 1980-2004 annual volumes of the Web of Science. Retrieved literature has undergone a structural as well as quantitative analysis. Patterns of national publication activity, citation impact and international collaboration are analysed for the 1990s and the new millennium.

Keywords: Activity, Analysis, Bibliometric, Citation, Collaboration, Developed, Fields, Impact, International, Literature, National, Publication, Publication Activity, Quantitative Analysis, Search, Search Strategy, Strategy, Techniques, Web of Science, World

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Full Text: [2009\Scientometrics79, 131.pdf](2009/Scientometrics79,%20131.pdf)

Abstract: The aim of this paper is to describe Spanish universities by means of structural, input and output indicators, to explore the relationship between those indicators and to analyse university behaviour in different dimensions. Seniority of the universities and environmental conditions are taken into account, together with input and output indicators, as well as others related to the networks and links established. Our results will contribute to the knowledge of the university research system in Spain, producing data that could be useful for research management at the institutional, regional and national level.

Keywords: Behaviour, Data, Environmental, Indicators, Institutional, Knowledge, Management, National, Networks, Performance, Regional, Relationship, Research, Research Performance, Spain, Spanish, Universities, University

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Full Text: [2009\Scientometrics79, 147.pdf](2009/Scientometrics79,%20147.pdf)

Abstract: Scientometric predictors of research performance need to be validated by showing that they have a high correlation with the external criterion they are trying to predict. The UK Research Assessment Exercise (RAE) - together with the growing movement toward making the full-texts of research articles freely available on the web - offer a unique opportunity to test and validate a wealth of old and new scientometric predictors, through multiple regression analysis: Publications, journal impact factors, citations, co-citations, citation chronometrics (age, growth, latency to peak, decay rate), hub/authority scores, h-index, prior funding, student counts, co-authorship scores, endogamy/exogamy, textual proximity, download/co-downloads and their chronometrics, etc. can all be tested and validated jointly, discipline by discipline, against their RAE panel rankings in the forthcoming parallel panel-based and metric RAE in 2008. The weights of each predictor can be calibrated to maximize the joint correlation with the rankings. Open Access Scientometrics will provide powerful new means of navigating, evaluating, predicting and analyzing the growing Open Access database, as well as powerful incentives for making it grow faster.

Keywords: Access, Age, Analysis, Citation, Citations, Co-Authorship, Coauthorship, Correlation, Database, Exercise, Factors, Funding, Growth, h Index, h-Index, Impact, Impact Factors, Incentives, Joint, Journal, Journal Impact, Journal Impact Factors, Latency, Movement, Multiple Regression, Performance, Predictors, Rae, Rankings, Regression, Regression Analysis, Research, Research Performance, Scientometric, Scientometrics, Student, UK, Wealth, Web, Weights

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Full Text: [2009\Scientometrics79, 157.pdf](2009/Scientometrics79,%20157.pdf)

Abstract: It has been shown that information collected from and about links between web pages and web sites can reflect real world phenomena and relationships between the organizations they represent. Yet, government linking has not been extensively studied from a webometric point of view. The aim of this study was to increase the knowledge of governmental interlinking and to shed some light on the possible real world phenomena it may indicate. We show that interlinking between local government bodies in Finland follows a strong geographic, or rather a geopolitical pattern and that governmental interlinking is mostly motivated by official cooperation that geographic adjacency has made possible.

Keywords: Analysis, Bodies, Business Information, Cooperation, Finland, Framework, Government, Impact Factors, Information, Interlinking, Knowledge, Links, Local, Local Government, Motivations, Organizations, Pattern, Relationships, Web, World

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Full Text: [2009\Scientometrics79, 171.pdf](2009/Scientometrics79,%20171.pdf)

Abstract: The German Research Foundation’s (DFG) Emmy Noether Programme aims to fund excellent young researchers in the postdoctoral phase and, in particular, to open up an alternative to the traditional route to professorial qualification via the Habilitation (venia legendi). This paper seeks to evaluate this funding programme with a combination of methods made up of questionnaires, interviews, appraisals of the reviews, and bibliometric analyses. The key success criteria in this respect are the frequency of professorial appointments plus excellent research performance demonstrated in the form of publications. Up to now, such postdoc programme evaluations have been conducted only scarcely. In professional terms, approved applicants are actually clearly better placed. The personal career satisfaction level is also higher among funding recipients. Concerning publications and citations, some minor performance differences could be identified between approved and rejected applicants. Nevertheless, we can confirm that, on average, the reviewers indeed selected the slightly better performers from a relatively homogenous group of very high-performing applicants. However, a comparison between approved and rejected applicants did not show that participation in the programme had decisively influenced research performance in the examined fields of medicine and physics.

Keywords: Alternative, Analyses, Bibliometric, Bibliometric Analyses, Career Satisfaction, Citations, Comparison, Criteria, Decisions, DFG, Excellence, Funding, Group, Interviews, Medicine, Methods, Minor, Open, Participation, Performance, Predictive-Validity, Professional, Publications, Questionnaires, Research, Research Performance, Respect, Reviews, Route, Satisfaction, Science, Success, Young

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Full Text: [2009\Scientometrics79, 191.pdf](2009/Scientometrics79,%20191.pdf)

Abstract: Opinions in the literature on the possible relationship between co-authorship and number of citations vary. This paper contributes to the debate with a further analysis of the subject, taking account of the number and quality of citations found for multi-(author, institution, country) and single-authored papers. The study is based on the scientific production of ten Carlos III University of Madrid departmental areas between 1997 and 2003 as reflected in the ISI Web of Science, and the number of times the respective papers were cited between 1997 and 2004. Univariate multifactorial analysis of variance (ANOVA) was used to verify the relationship between multi-authorship and visibility. The correlation between multi-institutional and multi-national authorship and the quartile of the citing journals was analyzed with correspondence analysis. The results show that while multi-institutional and multi-national authorship raise the number of citations, co-authorship and number of citations are unrelated. Correspondence analysis failed to show any correlation between the quartile of the citing journal and multi-institutional or multinational authorship, but did reveal a relationship between citing journal quartile and departmental area.

Keywords: Analysis, Anova, Authorship, Citations, Co-Authorship, Coauthorship, Correlation, Correspondence Analysis, Country, Impact, Institution, ISI, ISI Web of Science, Journal, Journals, Literature, Multiauthored Papers, Multinational, Papers, Production, Quality, Quality of, Relationship, Research, Scientific Collaboration, Scientific Production, Single, Visibility, Web of Science

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Full Text: [2009\Scientometrics79, 201.pdf](2009/Scientometrics79,%20201.pdf)

Abstract: The possibilities of the Response Surface Methodology (RSM) has been explored within the ambit of Scientific Activity Analysis. The case of the system “Departments of the Area of Health Sciences of the University of Navarre (Spain)” has been studied in relation to the system “Scientific Community in the Health Sciences”, from the perspective of input/output models (factors/response). It is concluded that the RSM reveals the causal relationships between factors and responses through the construction of polynomial mathematical models. Similarly, quasiexperimental designs are proposed, these permitting scientific activity to be analysed with minimum effort and cost and high accuracy.

Keywords: Accuracy, Activity, Application, Community, Construction, Cost, Effort, Factors, Mathematical Models, Minimum, Models, Relationships

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Full Text: [2009\Scientometrics79, 219.pdf](2009/Scientometrics79,%20219.pdf)

Abstract: The Scholarly Database aims to serve researchers and practitioners interested in the analysis, modelling, and visualization of large-scale data sets. A specific focus of this database is to support macro-evolutionary studies of science and to communicate findings via knowledge-domain visualizations. Currently, the database provides access to about 18 million publications, patents, and grants. About 90% of the publications are available in full text. Except for some datasets with restricted access conditions, the data can be retrieved in raw or pre-processed formats using either a web-based or a relational database client. This paper motivates the need for the database from the perspective of bibliometric/scientometric research. It explains the database design, setup, etc., and reports the temporal, geographical, and topic coverage of data sets currently served via the database. Planned work and the potential for this database to become a global testbed for information science research are discussed at the end of the paper.

Keywords: Access, Analysis, Coverage, Data, Database, Design, Information, Information Science, Knowledge Domains, Modelling, Patents, Potential, Practitioners, Publications, Relational Database, Research, Science, Science Research, Scientometrics, Support, Temporal, Utility, Visualization, Work

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Full Text: [2009\Scientometrics79, 235.pdf](2009/Scientometrics79,%20235.pdf)

Abstract: We present an application of the h-index in a context which does not include publications or citations. Rankings of library classification categories using the h-, g-and R-index are shown to be statistically equivalent. Moreover these indices seem to have the same discriminating power, as measured by the Gini concentration index. We further present best fitting Zipf-Mandelbrot functions for the h-distributions of classifications in different libraries.

Keywords: Application, Citations, Classification, Concentration, Context, Functions, h Index, h-Index, Index, Indices, Power, Publications, R-Index, Ranking, Scientists

? Markusova, V.A., Jansz, M., Libkind, A.N., Libkind, I. and Varshavsky, A. (2009), Trends in Russian research output in post-Soviet era. *Scientometrics*, **79** (2), 249-260.

Full Text: [2009\Scientometrics79, 249.pdf](2009/Scientometrics79,%20249.pdf)

Abstract: Recently, the Russian government has ordered evaluation and reform of the basic research system. As a consequence, the number of research staff at the Russian Academy of Sciences will be reduced by 20% by 2007. The basis for research evaluation and institute budgeting will be bibliometric indicators. In view of these changes we look at the Russian publication output and argue that (1)publication output and citedness have to be considered in relation to the level of expenditure on R&D bibliometric indicators depend strongly on the database used (ISI’s databases are biased) and their interpretation can be confusing, better coverage of Russian publications or a Russian Science Citation Index are needed. Also, research results are communicated in more ways than paper publications. policy makers have misused ISI statistics to demonstrate “a low level” of Russian R&D. Our paper is a part of a project designed to trace R&D development in a transition economy and knowledge transfer from basic research to innovation. Results of our project shed light on science policy and the social issues due to the indiscriminate introduction of quantitative indicators.

Keywords: Bibliometric, Bibliometric Indicators, Changes, Citation, Coverage, Database, Databases, Development, Economy, Evaluation, Government, Indicators, Innovation, ISI, Knowledge, Knowledge Transfer, Policy, Publication, Publications, R&D, Reform, Research, Research Evaluation, Research Results, Russian, Science, Science Citation Index, Science Policy, Social, Social Issues, Statistics, Trace, Transfer, Transition, Transition Economy

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Full Text: [2009\Scientometrics79, 261.pdf](2009/Scientometrics79,%20261.pdf)

Abstract: Bibliometric maps have the potential to become useful tools for science policy issues. The complexity of the structures, however, makes it often very difficult to interpret the results. In this study, we present a case study in which we use the bibliometric mapping results to address a high level science policy issue of research efficiency. By revealing the results in an alternative way, we increased the utility of bibliometric mapping within the science policy context. Moreover, by including additional information to the entities in the landscape, we provide useful input for the research potential.

Keywords: Alternative, Bibliometric, Bibliometric Mapping, Case Study, Complexity, Context, Efficiency, Information, Landscape, Mapping, Policy, Policy Issues, Potential, Research, Science, Science Policy, Utility

Onyancha, O.B. and Ocholla, D.N. (2009), Is HIV/AIDS in Africa distinct? What can we learn from an analysis of the literature? *Scientometrics*, **79** (2), 277-296.

Full Text: [2009\Scientometrics79, 277.pdf](2009/Scientometrics79,%20277.pdf)

Abstract: This paper investigates, through an analysis of the published literature, the notion held by several people that HIV/AIDS in Africa is unique. Using co-word and multidimensional scaling (MDS) analyses of MEDLINE-extracted HIV/AIDS records, this study used five lists of terms to investigate the related-ness of various factors and diseases to HIV/AIDS. The lists consisted of risk factors, sexually transmitted diseases, tropical diseases, opportunistic diseases, and pre-disposing factors. Data (i.e. words.txt - consisting of keywords/phrases describing the aforementioned factors and diseases, and text.txt - containing HIV/AIDS papers’ titles) were analyzed using TI computer-aided application software, developed by Leydesdorff. Results revealed that several factors and diseases that are pre-dominant in Sub-Saharan Africa exhibited strong and high pattern of co-occurrences with HIV/AIDS, implying close associated-ness with the epidemic in the region. Further areas of research, whose results will be used to make conclusive observations and arguments concerning the uniqueness of HIV/AIDS in Sub-Saharan Africa, are recommended.

Keywords: Africa, Analyses, Analysis, Application, Co-Word Analysis, Developed, Diseases, Epidemic, Factors, HIV, AIDS, Literature, MDS, Multidimensional, Multidimensional Scaling, Notion, Papers, Pattern, Predisposing Factors, Records, Research, Risk, Risk Factors, Scaling, Science, Sexually Transmitted Diseases, Software, Sub-Saharan Africa, TI, Tropical

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Full Text: [2009\Scientometrics79, 297.pdf](2009/Scientometrics79,%20297.pdf)

Abstract: This article reports for first time the state of science and technology in the African Continent on the basis of two scientometric indicators - number of research publications and number of patents awarded. Our analysis shows that Africa produced 68,945 publications over the 2000-2004 period or 1.8% of the World’s publications. In comparison India produced 2.4% and Latin America 3.5% of the World’s research. More detailed analysis reveals that research in Africa is concentrated in just two countries - South Africa and Egypt. These two counties produce just above 50% of the Continent’s publications and the top eight countries produce above 80% of the Continent’s research. Disciplinary analysis reveals that few African countries have the minimum number of scientists required for the functioning of a scientific discipline. Examination of the Continent’s inventive profile, as manifested in patents, indicates that Africa produces less than one thousand of the world’s inventions. Furthermore 88% of the Continent’s inventive activity is concentrated in South Africa. The article recommends that the African Governments should pay particular attention in developing their national research systems.

Keywords: Activity, Africa, African, America, Analysis, Assessment, Attention, Comparison, Counties, Developing, Egypt, First, Functioning, India, Indicators, Inventions, Latin America, Minimum, National, Patents, Publications, Research, Research Publications, Science, Science And Technology, Scientometric, South Africa, South-Africa, State, Systems, Technology, The State, Time

? Ramanana-Rahary, S., Zitt, M. and Rousseau, R. (2009), Aggregation properties of relative impact and other classical indicators: Convexity issues and the Yule-Simpson paradox. *Scientometrics*, **79** (2), 311-327.

Full Text: [2009\Scientometrics79, 311.pdf](2009/Scientometrics79,%20311.pdf)

Abstract: Among classical bibliometric indicators, direct and relative impact measures for countries or other players in science are appealing and standard. Yet, as shown in this article, they may exhibit undesirable statistical properties, or at least ones that pose questions of interpretation in evaluation and benchmarking contexts. In this article, we address two such properties namely sensitivity to the Yule-Simpson effect, and a problem related to convexity. The Yule-Simpson effect can occur for direct impacts and, in a variant form, for relative impact, causing an apparent incoherence between field values and the aggregate (all-fields) value. For relative impacts, it may result in a severe form of ‘out-range’ of aggregate values, where a player’s relative impact shifts from ‘good’ to ‘bad’, or conversely. Out-range and lack of convexity in general are typical of relative impact indicators. Using empirical data, we suggest that, for relative impact measures, ‘out-range’ due to lack of convexity is not exceptional. The Yule-Simpson effect is less frequent, and especially occurs for small players with particular specialisation profiles.

Keywords: Benchmarking, Bibliometric, Bibliometric Indicators, Citation, Data, Empirical, Evaluation, Field, General, Impact, Impacts, Indicators, International Scientific Collaboration, Journals, Problem, Profiles, Science, Sensitivity, Small, Standard, Statistical, Value, Values

? Romero-De-Pablos, A. and zagra-Caro, J.M. (2009), Internationalisation of patents by Public Research Organisations from a historical and an economic perspective. *Scientometrics*, **79** (2), 329-340.

Full Text: [2009\Scientometrics79, 329.pdf](2009/Scientometrics79,%20329.pdf)

Abstract: Within the field of the organisation of science, concerns about how academics generate patents tend to focus on a single set of either national or international patents. The main aim of this research is to study both national and international patenting in order to understand their differences. We have approached this issue from both a historical and an economic perspective, using data from the Spanish National Research Council (CSIC), the largest PRO in Spain. Three periods can be distinguished in the CSIC’s history, according to the political context, namely the dictatorship (1939-1975), the transition to democracy (1976-1986) and democracy (1987-to date). The prevailing legal and institutional framework has marked the way in which patenting by CSIC has evolved in each of these periods. The current situation is one in which there is strong internationalisation of patenting activity, and in this most-recent period we explore trends in some of the economic influences on patenting activity. We conclude that the political and normative context may shape the culture of international patenting at PROs like the CSIC and that increasing technological cooperation has supported this internationalisation. However, very often foreign partners are included in the application in order to extend protection abroad for commercial reasons, so their number may not be a good indicator of inventive activity.

Keywords: Activity, Application, Context, Cooperation, Csic, Culture, Data, Democracy, Economic, Field, Foreign, Framework, History, Indicator, Influences, Institutional, International, Internationalisation, Legal, National, Patents, Protection, Research, Science, Shape, Spain, Spanish, Transition, Trends, University

? Sandstrom, U. (2009), Research quality and diversity of funding: A model for relating research money to output of research. *Scientometrics*, **79** (2), 341-349.

Full Text: [2009\Scientometrics79, 341.pdf](2009/Scientometrics79,%20341.pdf)

Abstract: We analyze the relation between funding and output using bibliometric methods with field normalized data. Our approach is to connect individual researcher data on funding from Swedish university databases to data on incoming grants using the specific personal ID-number. Data on funding include the person responsible for the grant. All types of research income are considered in the analysis yielding a project database with a high level of precision. Results show that productivity can be explained by background variables, but that quality of research is more or less un-related to background variables.

Keywords: Analysis, Approach, Bibliometric, Bibliometric Methods, Data, Database, Databases, Distributions, Diversity, Field, Funding, Income, Methods, Model, Person, Precision, Productivity, Publication Productivity, Quality, Quality of, Research, Scientists, Scientometric Indicators, Universities, University, Variables

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Full Text: [2009\Scientometrics79, 351.pdf](2009/Scientometrics79,%20351.pdf)

Abstract: National shares of worldwide publications in the Science Citation Index (SCI) have shifted recently. The long-term decline in U.S. share accelerated in the mid-1990s, and now the EU has joined this decline. Not coincidentally, the shares of some countries have increased sharply, particularly those of China, S. Korea, Taiwan, and Singapore. Since the SCI constantly adds new journals, one reason might be that newly added journals were more favorable to them. To test this, the database was partitioned into “old journals” (added before 1995) and “new journals,” added afterward. The analysis was done for eight of the 20 fields of science defined by the National Science Indicator CD. In some fields, new journals were indeed much more favorable to the Asians. In some fields, however, new journals were actually more favorable to the U.S. In aggregate over the eight fields analyzed, the size of this effect was too small to account for much of the sharp changes in national shares. Furthermore tests between old and new journals find that differences in most fields are not statistically significant. The results provide evidence that the SCI can be used to accurately track national publication changes over time.

Keywords: Analysis, Asians, Bias, CD, Changes, China, Citation, Database, EU, Evidence, Journals, Korea, Long Term, Long-Term, National, Publication, Publications, SCI, Science, Science Citation Index, Singapore, Size, Small, Taiwan, Tests, Time

? Small, H. and Upham, P. (2009), Citation structure of an emerging research area on the verge of application. *Scientometrics*, **79** (2), 365-375.

Full Text: [2009\Scientometrics79, 365.pdf](2009/Scientometrics79,%20365.pdf)

Abstract: A case study of an emerging research area is presented dealing with the creation of organic thin film transistors, a subtopic within the general area called “plastic electronics.” The purpose of this case study is to determine the structural properties of the citation network that may be characteristic of the emergence, development, and application or demise of a research area. Research on organic thin film transistors is highly interdisciplinary, involving journals and research groups from physics, chemistry, materials science, and engineering. There is a clear path to industrial applications if certain technical problems can be overcome. Despite the applied nature and potential for patentable inventions, scholarly publications from both academia and industry have continued at a rapid pace through 2007. The question is whether the bibliometric indicators point to a decline in this area due to imminent commercialization or to insurmountable technical problems with these materials.

Keywords: Academia, Application, Bibliometric, Bibliometric Indicators, Case Study, Chemistry, Citation, Citation Network, Development, Emergence, Emerging, Engineering, Film, General, Groups, Indicators, Industry, Interdisciplinary, Inventions, Journals, Network, Organic, Potential, Publications, Purpose, Rapid, Research, Science, Specialty, Structure, Thin Film

? Thijs, B. and Glänzel, W. (2009), A structural analysis of benchmarks on different bibliometrical indicators for European research institutes based on their research profile. *Scientometrics*, **79** (2), 377-388.

Full Text: [2009\Scientometrics79, 377.pdf](2009/Scientometrics79,%20377.pdf)

Abstract: The present study is part of an ongoing project on clustering European research institutions according to their publication profiles. Using hierarchical clustering eight clusters have been found the optimum solution for the classification. Aim of the present study is a structural analysis for the evaluation of research performance of specialised and multidisciplinary institutions. A breakdown by subject fields is used to characterise field-specific peculiarities of individual clusters by bibliometric indicators and to allow comparison within the same and among different clusters. Finally, benchmarks can then be used to study national research performance on basis of the institutional classification.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Classification, Clustering, Comparison, Evaluation, Indicators, Institutional, Institutions, Multidisciplinary, National, Performance, Profiles, Publication, Research, Research Performance, Self-Citation, Solution, Structural Analysis

? van Leeuwen, T.N. (2009), Strength and weakness of national science systems: A bibliometric analysis through cooperation patterns. *Scientometrics*, **79** (2), 389-408.

Full Text: [2009\Scientometrics79, 389.pdf](2009/Scientometrics79,%20389.pdf)

Abstract: In this study we have focused on long term developments of various types of scientific publishing, and the field-normalized impact generated by these various types. The types of scientific output distinguished are output resulting from international cooperation, national cooperation, and single address publications, in which no apparent cooperation is found. A fourth type is distinguished by focusing on first authorship, within the international cooperation output. Changes in especially the share of a country’s output from first-authored international cooperation and the share of single address publications can be regarded as indicators of strength and/or weakness of a science system.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Cooperation, First, Impact, Indicators, International, International Cooperation, International Scientific Collaboration, Long Term, Long-Term, National, Publications, Publishing, Science, Scientific Output, Strength, Systems, Term

? Vinkler, P. (2009), Introducing the Current Contribution Index for characterizing the recent, relevant impact of journals. *Scientometrics*, **79** (2), 409-420.

Full Text: [2009\Scientometrics79, 409.pdf](2009/Scientometrics79,%20409.pdf)

Abstract: The Garfield (Impact) Factor characterizes the measure of the up to date specific contribution of scientific journals to the total impact of the journals in a special field. A new indicator (Current Contribution Index, CCI) was introduced in order to characterize the relative contribution of journals to recent, relevant knowledge of a corresponding field. The CC Index relates the number of citations received by a journal in a given year to the total number of citations obtained by all journals of the corresponding field in that year. Mean Garfield Factors and mean Current Contribution Indexes were calculated for some fields and several journals. No significant correlation was found between the Garfield Factor (GF) and Current Contribution Index (CCI) of journals. The ratios of the GF to CCI referring to the corresponding top 10, 20 or 50 per cent of the journals ranked by decreasing GF and CCI, strongly differ by field.

Keywords: Citations, Contribution, Correlation, Field, Impact, Indicator, Journal, Journals, Knowledge, Measure, Science, Scientific Journals, Scientometric Indicators

? Yang, L.Y., Morris, S.A. and Barden, E.M. (2009), Mapping institutions and their weak ties in a specialty: A case study of cystic fibrosis body composition research. *Scientometrics*, **79** (2), 421-434.

Full Text: [2009\Scientometrics79, 421.pdf](2009/Scientometrics79,%20421.pdf)

Abstract: The paper demonstrates visualization technique that show the collaboration structure of institutions in the specialty and the researchers that function as weak ties among them. Institution names were extracted from the collection of papers and disambiguated using the Derwent Analytics (v1.2) software product. Institutions were clustered into collaboration groups based on their co-occurrence in papers. A crossmap of clustered institutions against research fronts, which were derived using bibliographic coupling analysis, shows the research fronts that specific institutions participate in, their collaborator institutions and the research fronts in which those collaborations occurred. A crossmap of institutions to author teams, derived from co-authorship analysis, reveals research teams in the specialty and their general institutional affiliation, and further identifies the researchers that function as weak ties and the institutions that they link. The case study reveals that the techniques introduced in this paper can be used to extract a large amount of useful information about institutions participating in a research specialty.

Keywords: Affiliation, Analysis, Bibliographic Coupling, Body Composition, Case Study, Co-Authorship, Coauthorship, Collaboration, Collaborations, Collection, Composition, Cystic Fibrosis, Fibrosis, Function, General, Groups, Information, Institutional, Institutions, Papers, Research, Research Collaboration, Research Fronts, Software, Specialty, Structure, Teams, Technique, Techniques, Visualization

? Yoshikane, F., Nozawa, T., Shibui, S. and Suzuki, T. (2009), An analysis of the connection between researchers’ productivity and their co-authors’ past attributions, including the importance in collaboration networks. *Scientometrics*, **79** (2), 435-449.

Full Text: [2009\Scientometrics79, 435.pdf](2009/Scientometrics79,%20435.pdf)

Abstract: Although many studies have analyzed the “synchronic” correlation of properties between authors and their co-authors, the “diachronic” correlation of properties, i.e., the correlation between their subsequent and precedent activity, has not yet been sufficiently studied using quantitative methods. This study pays attention not only to productivity but also the importance in the collaboration network as a measure of the researcher’s activity, and clarifies whether there is any connection between (i) the researcher’s activity subsequent to a collaboration and (II) the collaborator’s precedent activity, aiming at deriving knowledge about the diachronic effect of collaborators.

Keywords: Activity, Analysis, Attention, Attributions, Authors, Co-Authors, Coauthorship Networks, Collaboration, Collaboration Networks, Correlation, Invisible-Colleges, Knowledge, Measure, Methods, Network, Networks, Patterns, Productivity, Quantitative Methods, Science, Scientific Collaboration, Students

? Tsay, M.Y. (2009), Citation analysis of Ted Nelson’s works and his influence on hypertext concept. *Scientometrics*, **79** (3), 451-472.

Full Text: [2009\Scientometrics79, 451.pdf](2009/Scientometrics79,%20451.pdf)

Abstract: This study investigates Ted Nelson’s works and the influence of his hypertext concept through citation analysis, including citation counting, characteristics of citing articles on language, document type, citing year, discipline, and citation content. The selection of the Nelson’s works was based on searching Library Literature & Information Science, Library and Information Science Abstracts, Google and Yahoo search engines. The citation data were compiled from the database of Web of Science. The results of the study reveal that hypertext has directly great impact on information retrieval and world wide web, therefore, the concept has had profound influence on information, library and computer science disciplines. Moreover, the influence of Nelson’s works spreads to other disciplines variously, especially on education, literature, business and economics, engineering, sociology, psychology, etc. The citation context analysis of citing articles on information and library science reveals that (1) definition, orientation and general introduction of hypertext, (2) relation of Vannevar Bush and Ted Nelson in terms of hypertext, (3) Nelson’s Xanadu system and its component of hypertext, (4) the application of hypertext in information science and library science are four most citing purpose.

Keywords: Analysis, Business, Citation, Computer Science, Context, Database, Discipline, Disciplines, Document, Economics, Education, Engineering, Hypermedia, Impact, Influence, Information, Information-Retrieval, Language, Libraries, Literature, Psychology, Science, Selection, Web

? Lopez-Illescas, C., Noyons, E.C.M., Visser, M.S., De Moya-Anegon, F. and Moed, H.F. (2009), Expansion of scientific journal categories using reference analysis: How can it be done and does it make a difference? *Scientometrics*, **79** (3), 473-490.

Full Text: [2009\Scientometrics79, 473.pdf](2009/Scientometrics79,%20473.pdf)

Abstract: This paper explores a methodology for delimitating scientific subfields by combining the use of (specialist) journal categories from Thomson Scientific’s Web of Science (WoS) and reference analysis. In a first step it selects all articles in journals included in a particular WoS journal category covering a subfield. These journals are labelled as a subfield’s specialist journals. In a second step, this set of papers is expanded with papers published in other, additional journals and citing a subfield’s specialist journals with a frequency exceeding a certain citation threshold. Data are presented for two medical subfields: Oncology and Cardiac & Cardiovascular System. A validation based on findings from earlier studies, from an analysis of MESH descriptors from MEDLINE, and on expert opinion provides evidence that the proposed methodology has a high precision, and that expansion substantially enhanced the recall, not merely in terms of the number of retrieved papers, but also in terms of the number of research topics covered. The paper also examines how a bibliometric ranking of countries and universities based on the citation impact of their papers published in a subfield’s specialist journals compares to that of a ranking based on the impact of their articles in additional journals. Rather weak correlations especially obtained at the level of universities underline the conclusion from earlier studies that an assessment of research groups or universities in a scientific subfield that takes into account solely papers published in a subfield’s specialist journals is unsatisfactory.

Keywords: Analysis, Assessment, Bibliometric, Cancer-Research, Cardiovascular, Categories, Citation, Difference, Evidence, Impact, Information, Item Subject Classification, Journal, Journals, Maps, Medical, Methodology, Research, Science, Validation

? Gouveia, F.C. and Kurtenbach, E. (2009), Mapping the web relations of science centres and museums from Latin America. *Scientometrics*, **79** (3), 491-505.

Full Text: [2009\Scientometrics79, 491.pdf](2009/Scientometrics79,%20491.pdf)

Abstract: In Latin America, interactive science centres and museums are key institutions for science communication. In order to map their relationship over the Internet, a Web co-link analysis was applied to 18 websites of science centres and museums affiliated to the Network for the Popularization of Science and Technology in Latin America and the Caribbean - RedPOP. Clustering analysis, multidimensional scaling (MDS) and an analysis of all pages with links to at least two websites were performed. Results showed that language barriers played a prominent role in clustering, with external recognition by the target public representing a secondary issue.

Keywords: Analysis, Barriers, Communication, Institutions, Internet, Key, Language, Language Barriers, Latin America, Recognition, Relations, Relationship, Science, Secondary, Web

? Arencibia-Jorge, R. and Rousseau, R. (2009), Influence of individual researchers’ visibility on institutional impact: an example of Prathap’s approach to successive h-indices. *Scientometrics*, **79** (3), 507-516.

Full Text: [2009\Scientometrics79, 507.pdf](2009/Scientometrics79,%20507.pdf)

Abstract: This study applies Prathap’s approach to successive h-indices in order to measure the influence of researcher staff on institutional impact. The twelve most productive Cuban institutions related to the study of the human brain are studied. The Hirsch index was used to measure the impact of the institutional scientific output, using the g-index and R-index as complementary indicators. Prathap’s approach to successive h-indices, based on the author-institution hierarchy, is used to determine the institutional impact through the performance of the researcher staff. The combination of different Hirsch-type indices for institutional evaluation is illustrated.

Keywords: Evaluation, Hierarchy, Human, Impact, Indicators, Indices, Individual, Influence, Institutions, Performance, Scientific-Research Output, Staff

? Abramo, G., D’Angelo, C.A. and Caprasecca, A. (2009), Gender differences in research productivity: A bibliometric analysis of the Italian academic system. *Scientometrics*, **79** (3), 517-539.

Full Text: [2009\Scientometrics79, 517.pdf](2009/Scientometrics79,%20517.pdf)

Abstract: The literature dedicated to the analysis of the difference in research productivity between the sexes tends to agree in indicating better performance for men. Through bibliometric examination of the entire population of research personnel working in the scientific-technological disciplines of Italian university system, this study confirms the presence of significant differences in productivity between men and women. The differences are, however, smaller than reported in a large part of the literature, confirming an ongoing tendency towards decline, and are also seen as more noticeable for quantitative performance indicators than other indicators. The gap between the sexes shows significant sectorial differences. In spite of the generally better performance of men, there are scientific sectors in which the performance of women does not prove to be inferior.

Keywords: Ability, Academic, Analysis, Bibliometric, Difference, Disciplines, Gender, Gender Differences, Impact, Indicators, Literature, Men, Meta-Analysis, Metaanalysis, Performance, Performance Indicators, Population, Presence, Productivity, Publication Productivity, Quantitative, Research, Scientific Productivity, Sex-Differences, University, Women

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Full Text: [2009\Scientometrics79, 541.pdf](2009/Scientometrics79,%20541.pdf)

Abstract: Impact factors for 20 journals ranked first by Journal Citation Reports (JCR) were compared with the same indicator calculated on the basis of citation data obtained from Scopus database. A significant discrepancy was observed as Scopus, though results differed from title to title, found in general more citations than listed in JCR. This also affected ranking of the journals. More thorough examination of two selected titles proved that the divergence resulted mainly from difference in coverage of two products, although other important factors also play their part.

Keywords: Citation, Citations, Coverage, Database, Databases, Difference, Economic, Factors, Google-Scholar, Index, ISI, Journals, Play, Web-of-Science

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Full Text: [2009\Scientometrics79, 551.pdf](2009/Scientometrics79,%20551.pdf)

Abstract: This paper briefly reviews the knowledge-generation process and explores to what degree technical and scientific knowledge from prior art anticipates novelty or the inventive step of an invention. Inventions are novel if they have not been described (in the public) before, and they are inventive if the technical solution was non-obvious to a skilled person in the field. We employ a novel approach of patent citation analysis to investigate this phenomenon. Since in this context common approaches of such citation analysis are biased (usually, citations are neither exhaustive nor relevant in their entirety), we focus on examination reports of European patent applications and the references given therein. Our findings reveal that particularly technical knowledge comprised in patents serves as a source of novelty, while scientific knowledge frequently stems from multiple scientific papers and accounts for the inventive step. In addition, it is found that in many cases scientific knowledge is of commercial relevance and therefore constitutes more than general background information that aids the technical knowledge generation process.

Keywords: Analysis, Applications, Art, Background, Citation, Citations, Context, Documents, Fish-Oil, Generation, Information, Knowledge, Literature-Based Discovery, Literatures, Novel, Process, Raynauds, Relevance, Science, Scientific Knowledge, Sources, Technological Search

? Jang, S.L., Lo, S.M. and Chang, W.H. (2009), How do latecomers catch up with forerunners? Analysis of patents and patent citations in the field of flat panel display technologies. *Scientometrics*, **79** (3), 563-591.

Full Text: [2009\Scientometrics79, 563.pdf](2009/Scientometrics79,%20563.pdf)

Abstract: This paper sets out to explore the patterns of technological change and knowledge spillover in the field of flat panel display (FPD) technology, along with the catching-up behavior of latecomers, through the analysis of US patents and patent citations between 1976 and 2005. Our results show that: (i) the catching-up by FPD technology latecomers began at the transition stage (1987-1996) when the dominant design became established in areas with high ‘revealed technology advantage’ (RTA), (II) there is no apparent localization of knowledge spillover amongst FPD technology latecomers, instead, higher citation frequencies of forerunners’ patents were found in latecomers’ FPD patents during the transition (1987-1996) and post-dominant design (1997-2005) stages and, and (iii) a few extraordinary peaks were found in the citation frequency of forerunners’ patents at long citation lags in latecomers’ FPD patents, particularly during the transition stage (1987-1996), indicative of the knowledge threshold which latecomers need to cross in order to catch up with forerunners.

Keywords: Analysis, Behavior, Change, Citation, Citations, Design, Indicators, Innovation, Knowledge, Knowledge-Diffusion, Korea, Market Value, Mobility, Need, Networks, Patterns, Regimes, Schumpeterian Patterns, Spillover, Spillovers, Technology, Transition, US

? Zhou, P., Thijs, B. and Glänzel, W. (2009), Is China also becoming a giant in social sciences? *Scientometrics*, **79** (3), 593-621.

Full Text: [2009\Scientometrics79, 593.pdf](2009/Scientometrics79,%20593.pdf)

Abstract: At present China is challenging the leading sciento-economic powers and evolving to one of the world’s largest potentials in science and technology. Jointly with other emerging economies, China has already changed the balance of power among the formerly leading nations as measured by scientific production. In the present paper, the evolution of China’s publication activity and citation impact in the social sciences is studied for the period 1997-2006. Besides the comparative analysis of trends in publication and citation patterns and of national publication profiles, an attempt is made to interpret the results in both the regional and global context.

Keywords: Analysis, China, Citation, Citation-Index, Collaboration, Comparative, Context, Database, Evolution, Impact, Indicators, Journals, Patterns, Power, Production, Research Performance, Science, Social, Social Sciences, Technology, Trends

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Full Text: [2009\Scientometrics79, 623.pdf](2009/Scientometrics79,%20623.pdf)

Abstract: The paper investigates three aspects of patent value - technological value, direct economic value, and indirect economic value. The paper suggests that we measure the technological value of a patent by looking at its number of citations, direct economic value by looking at its licensing and income from royalties, and indirect economic value by looking at its life (i.e., duration). For the research, the author’s two previous studies are deeply explored. It is found that these three aspects of patent value are positively correlated with one another. In addition, their domains overlap and interrelate. Research collaboration is the one variable found to have a significant effect on all three aspects. The field effect of electronics positively affects technological and indirect economic value, whereas research team size negatively affects technological and indirect economic value.

Keywords: Affect, Analysis, Citations, Collaboration, Domains, Economic, Income, Life, Research

? Archambault, E. and Lariviere, V. (2009), History of the journal impact factor: Contingencies and consequences. *Scientometrics*, **79** (3), 635-649.

Full Text: [2009\Scientometrics79, 635.pdf](2009/Scientometrics79,%20635.pdf)

Abstract: This paper examines the genesis of journal impact measures and how their evolution culminated in the journal impact factor (JIF) produced by the Institute for Scientific Information. The paper shows how the various building blocks of the dominant JIF (published in the Journal Citation Report - JCR) came into being. The paper argues that these building blocks were all constructed fairly arbitrarily or for different purposes than those that govern the contemporary use of the JIF. The results are a faulty method, widely open to manipulation by journal editors and misuse by uncritical parties. The discussion examines some solution offered to the bibliometrics and scientific communities considering the wide use of this indicator at present.

Keywords: Communities, Consequences, Discussion, Evolution, Impact, Journal, Measures, Performance, Science, Subject Categories

? Arruda, D., Bezerra, F., Neris, V.A., De Toro, P.R. and Wainer, J. (2009), Brazilian computer science research: Gender and regional distributions. *Scientometrics*, **79** (3), 651-665.

Full Text: [2009\Scientometrics79, 651.pdf](2009/Scientometrics79,%20651.pdf)

Abstract: This paper analysis the distribution of some characteristics of computer scientists in Brazil according to regions and gender. Computer scientist is defined as the faculty of a graduate level computer science department. Under this definition, there were 886 computer scientists in Brazil in November 2006.

Keywords: Analysis, Brazil, Computer Science, Distribution, Faculty, Gender, Pipeline, Publications, Research, Science, Technology, Women

? Ball, R. (2009), Scholarly communication in transition: The use of question marks in the titles of scientific articles in medicine, life sciences and physics 1966-2005. *Scientometrics*, **79** (3), 667-679.

Full Text: [2009\Scientometrics79, 667.pdf](2009/Scientometrics79,%20667.pdf)

Abstract: The titles of scientific articles have a special significance. We examined nearly 20 million scientific articles and recorded the development of articles with a question mark at the end of their titles over the last 40 years. Our study was confined to the disciplines of physics, life sciences and medicine, where we found a significant increase from 50% to more than 200% in the number of articles with question-mark titles. We looked at the principle functions and structure of the titles of scientific papers, and we assume that marketing aspects are one of the decisive factors behind the growing usage of question-mark titles in scientific articles.

Keywords: Abstracts, Colons, Communication, Development, Disciplines, Factors, Life, Myth, Number, Structure, Titular Colonicity, Transition

? Garcia-Santiago, L. and De Moya-Anegon, F. (2009), Using co-outlinks to mine heterogeneous networks. *Scientometrics*, **79** (3), 681-702.

Full Text: [2009\Scientometrics79, 681.pdf](2009/Scientometrics79,%20681.pdf)

Abstract: Clustering is applied to web co-outlink analysis to represent the heterogeneous nature of the World Wide Web in terms of the “triple helix” model (university-industry-government). An initial categorization is based on families of websites, which is then matched with Spanish institutions from diverse sectors represented on the Web, to uncover cognitive structures and related subgroups with common interests and confirm the junction of sectors of the “triple helix” model. We may conclude that the clustering method applied to web co-outlink analysis works when fully institutionalized organizations are studied, to make their interconnections manifest.

Keywords: Analysis, Citations, Cognitive, Families, Heterogeneous, Hyperlinks, Industry-Government Relations, Information, Institutions, Links, Model, Networks, Organizations, Triple-Helix, Web, Web Environment, Webometrics

? Marx, W. and Cardona, M. (2009), The citation impact outside references - formal versus informal citations. *Scientometrics*, **80** (1), 1-21.

Full Text: [2009\Scientometrics80, 1.pdf](2009/Scientometrics80,%201.pdf)

Abstract: In this study the amount of “informal” citations (i.e. those mentioning only author names or their initials instead of the complete references) in comparison to the “formal” (full reference based) citations is analyzed using some pioneers of chemistry and physics as examples. The data reveal that the formal citations often measure only a small fraction of the overall impact of seminal publications. Furthermore, informal citations are mainly given instead of (and not in addition to) formal citations. As a major consequence, the overall impact of pioneering articles and researchers cannot be entirely determined by merely counting the full reference based citations.

Keywords: Citation, Citations, Comparison, Crystals, Current Situation, Fraction, Impact, Light Diffusion, Quantum-Mechanics, Wave Mechanics

? Takeda, Y., Mae, S., Kajikawa, Y. and Matsushima, K. (2009), Nanobiotechnology as an emerging research domain from nanotechnology: A bibliometric approach. *Scientometrics*, **80** (1), 23-38.

Full Text: [2009\Scientometrics80, 23.pdf](2009/Scientometrics80,%2023.pdf)

Abstract: Nanotechnology has been intensively investigated by bibliometric methods due to its technological importance and expected impacts on economic activity. However, there is less focus on nanobiotechnology, which is an emerging research domain in nanotechnology. In this paper, we study the current status of the former, with our primary focus being to reveal the structure and research domains in nanobiotechnology. We also examine country and institutional performance in nanobiotechnology. It emerged that nanostructures, drug delivery and biomedical applications, bio-imaging, and carbon nanotubes and biosensors are the major research domains, while the USA is the leading country, and China has also made substantial contribution. Most institutions having a major impact in the area of nanobiotechnology are located in the USA.

Keywords: Applications, Bibliometric, Carbon, Carbon Nanotubes, China, Citation Analysis, Collaboration, Current, Domains, Drug, Economic, Impact, Institutions, Methods, Nano-Technology, Networks, Patents, Patterns, Performance, Research, Research-and-Development, Science, Status, Structure, Technology Field, Trends, USA

? Li, L.L., Ding, G.H., Feng, N., Wang, M.H. and Ho, Y.S. (2009), Global stem cell research trend: Bibliometric analysis as a tool for mapping of trends from 1991 to 2006. *Scientometrics*, **80** (1), 39-58.

Full Text: [2009\Scientometrics80, 39.pdf](2009/Scientometrics80,%2039.pdf)

Abstract: In this study, we aim to evaluate the global scientific production of stem cell research for the past 16 years and provide insights into the characteristics of the stem cell research activities and identify patterns, tendencies, or regularities that may exist in the papers. Data are based on the online version of SCI, Web of Science from 1991 to 2006. Articles referring to stem cell were assessed by many aspects including exponential fitting the trend of publication outputs during 1991-2006, distribution of source title, author keyword, and keyword plus analysis. Based on the exponential fitting the yearly publicans of the last decade, it can also be calculated that, in 2,011, the number of scientific papers on the topic of stem-cell will be twice of the number of publications in 2006. Synthetically analyzing three kinds of keywords, it can be concluded that application of stem cell transplantation technology to human disease therapy, especially research related on “embryonic stem cell” and “mesenchymal stem cell” is the orientation of all the stem cell research in the 21(st) century. This new bibliometric method can help relevant researchers realize the panorama of global stem cell research, and establish the further research direction.

Keywords: Activities, Articles, Bibliometric, Bibliometric Analysis, Bone-Marrow-Transplantation, Characteristics, Differentiation, Diseases, Distribution, Global, Growth, Human, Mapping, Model, Number of Publications, Pluripotency, Production, Productivity, Publication, Publications, Regeneration, Research, Research Trend, Researchers, SCI, Science, Scientific Production, Technology, Therapy, Topic, Transplantation, Trend, Trends, Web of Science

? Liu, Y.X., Rao, I.K.R. and Rousseau, R. (2009), Empirical series of journal h-indices: The JCR category Horticulture as a case study. *Scientometrics*, **80** (1), 59-74.

Full Text: [2009\Scientometrics80, 59.pdf](2009/Scientometrics80,%2059.pdf)

Abstract: Two types of series of h-indices for journals published in the field of Horticulture during the period 1998-2007 are calculated. Type I h-indices are based on yearly data, while type II h-indices use cumulative data. These h-indices are also considered in a form normalised with respect to the number of published articles. It is observed that type I h-indices, normalised or not, decrease linearly over a period of ten years. The type II series, however, is not linear in nature: it exhibits partly a concave shape. This proves that the journals (in Horticulture) do not exhibit a linear increase in h-index as argued by Hirsch in the case of life-time achievements of scientists. In the second part of the paper, an attempt is made to study the relative visibility of a journal and its change over time, based on h-indices of journals. It is shown that: the h-index over the complete period 1998-2007 of the journal Theoretical & Applied Genetics (h = 62) is much higher than that of all other journals in the field the relation between the number of publications and the type II h-index for the whole period is not an exact power law (as it would have to be if the Egghe-Rousseau model were applicable) in order to study the dynamic aspects of journal visibility, a field-relative normalised h-ratio is defined to monitor systematic changes in the field of Horticulture. Except for two journals, the Pearson correlation coefficient for yearly values of this field-relative normalised h-ratio indicates that there is no systematic change of the performance of the journals with respect to the field as a whole.

Keywords: Case Study, Change, Changes, Correlation, Correlation Coefficient, Dynamic, Hirsch-Index, Journal, Journals, Law, Lifetime, Model, Performance, Power, Time, Values

? Kim, H. and Lee, J.Y. (2009), Archiving research trends in LIS domain using profiling analysis. *Scientometrics*, **80** (1), 75-90.

Full Text: [2009\Scientometrics80, 75.pdf](2009/Scientometrics80,%2075.pdf)

Abstract: This study aims to provide archiving research trends from the perspective of the field of library and information science using profiling analysis method. The LISA database has been selected as the representative database in the library and information science field, and articles have been searched via the keyword ‘archiv\*’. The analysis methods used in this study were the journal profiling method and the descriptor profiling method. The descriptor profiling method presents descriptors as a bag of words. That is, it represents descriptors according to the word sets which are included in the documents in which those descriptors are assigned. As a result of journal analysis, six representative journals which are closely related to archiv\* have been identified. The six journals were Archivaria, Advanced Technology Libraries, Journal of the Society of Archivists, American Archivist, Archifacts, and Records Management Bulletin. The results of descriptor analysis show that the most comprehensive and core subject was digital libraries, and the most comprehensive and core object was the electronic media. Another result of detailed analysis shows that the outstanding objects were publications, special collections/sound, cultural heritage, television, image/photographs, internet/bibliographic data, and DB/newspapers. On the other hand, outstanding subjects were Archives, National Libraries, Universities, Libraries and companies.

Keywords: American, Analysis, Database, Electronic Media, Information, Journal, Journals, Lis, Media, Methods, Research, Science, Television, Trends

? Zhao, Y.Y., Cui, L. and Yang, H. (2009), Evaluating reliability of co-citation clustering analysis in representing the research history of subject. *Scientometrics*, **80** (1), 91-102.

Full Text: [2009\Scientometrics80, 91.pdf](2009/Scientometrics80,%2091.pdf)

Abstract: This paper aimed to examine the reliability of co-citation clustering analysis in representing the research history of subject by comparing the results from co-citation clustering analysis with a review written by authorities. Firstly, the treatment of traumatic spinal cord injury was chosen as an investigated subject to be retrieved the resource articles and their references were downloaded from Science Citation Index CD-ROM between 1992 and 2002. Then, the highly cited papers were arranged chronologically and clustered with the method of co-citation clustering. After mapping the time line visualization, the history and structure of treatment of spinal cord injury were presented clearly. At last, the results and the review were compared according the time period, and then the recall and the precision were calculated. The recall was 37.5%, and the precision was 54.5%. The research history of traumatic spinal cord injury treatment analyzed by co-citation clustering was nearly consistent with authoritative review, although some clusters had shorter period than which was summarized by professionals. This paper concluded that co-citation clustering analysis was a useful method in representing the research history of subject, especially for the information researchers, who do not have enough professional knowledge. Its demerit of low recall could be offset by combination this method with other analytic techniques.

Keywords: Analysis, Authoritative, History, Information, Injury, Knowledge, Mapping, Professional Knowledge, Professionals, Reliability, Research, Review, Spinal Cord, Structure, Traumatic, Treatment

? Schneider, J.W., Larsen, B. and Ingwersen, P. (2009), A comparative study of first and all-author co-citation counting, and two different matrix generation approaches applied for author co-citation analyses. *Scientometrics*, **80** (1), 103-130.

Full Text: [2009\Scientometrics80, 103.pdf](2009/Scientometrics80,%20103.pdf)

Abstract: The present article contributes to the current methodological debate concerning author co-citation analyses. (ACA) The study compares two different units of analyses, i.e. first- versus inclusive all-author co-citation counting, as well as two different matrix generation approaches, i.e. a conventional multivariate and the so-called Drexel approach, in order to investigate their influence upon mapping results. The aim of the present study is therefore to provide more methodological awareness and empirical evidence concerning author co-citation studies. The study is based on structured XML documents extracted from the IEEE collection. These data allow the construction of ad-hoc citation indexes, which enables us to carry out the hitherto largest all-author co-citation study. Four ACA are made, combining the different units of analyses with the different matrix generation approaches. The results are evaluated quantitatively by means of multidimensional scaling, factor analysis, Procrustes and Mantel statistics. The results show that the inclusion of all cited authors can provide a better fit of data in two-dimensional mappings based on MDS, and that inclusive all-author co-citation counting may lead to stronger groupings in the maps. Further, the two matrix generation approaches produce maps that have some resemblances, but also many differences at the more detailed levels. The Drexel approach produces results that have noticeably lower stress values and are more concentrated into groupings. Finally, the study also demonstrates the importance of sparse matrices and their potential problems in connection with factor analysis. We can confirm that inclusive all-ACA produce more coherent groupings of authors, whereas the present study cannot clearly confirm previous findings that first-ACA identifies more specialties, though some vague indication is given. Most crucially, strong evidence is given to the determining effect that matrix generation approaches have on the mapping of author co-citation data and thus the interpretation of such maps. Evidence is provided for the seemingly advantages of the Drexel approach.

Keywords: ACA, Analysis, Awareness, Citation, Classification, Coefficient, Comparative, Current, Evidence, Factor Analysis, Generation, Inclusion, Influence, Information-Science, Lead, Mapping, Maps, Networks, Problems, Proximity-Measures, Resemblance, Statistics, Stress, Values

? Acosta, M., Coronado, D. and Fernandez, A. (2009), Exploring the quality of environmental technology in Europe: evidence from patent citations. *Scientometrics*, **80** (1), 131-152.

Full Text: [2009\Scientometrics80, 131.pdf](2009/Scientometrics80,%20131.pdf)

Abstract: In this paper we carry out an empirical analysis to address some questions concerning the production and quality of technology in environmental sectors. The methodology involves patents as a measure of the generation of new knowledge, and patent citations as a proxy for the quality of a technological invention. The sample contains more than 12,000 environmental European patents from firms and government institutions from 1998 to 2004. From our econometric analysis, we found that environmental patents applied by individual inventors present on average less quality that those applied by institutional inventors. The size of family patent is relevant to explain forward patent citation. Furthermore, patents coming from abroad (out of Europe), in particular with US and Japan priority, are more cited on average than local patents (with European priority). Lastly, the specialization in environmental fields of a patent plays a negative role in determining the frequency of forward citation.

Keywords: Analysis, Citation, Citations, Diffusion, Environmental, Europe, Evidence, Family, Generation, Government Institutions, Impact, Indicators, Individual, Innovation, Institutions, Japan, Knowledge, Methodology, Policy, Production, Quality, Rights, Technology, US

? Gantman, E.R. (2009), International differences of productivity in scholarly management knowledge. *Scientometrics*, **80** (1), 153-165.

Full Text: [2009\Scientometrics80, 153.pdf](2009/Scientometrics80,%20153.pdf)

Abstract: Using a dataset of refereed conference papers, this work explores the determinants of academic production in the field of management. The estimation of a count data model shows that the countries’ level of economic development and their economy size have a positive and highly significant effect on scholarly management knowledge production. The linguistic variable (English as official language), which has been cited by the literature as an important factor facilitating the participation in the international scientific arena, has also a positive and statistically significant effect.

Keywords: Academic, Determinants, Development, Economic, Economic Development, International, Knowledge, Language, Literature, Management, Model, Participation, Production, Productivity, Science, Technology, Work, World

? Mukherjee, B. (2009), Scholarly research in LIS open access electronic journals: A bibliometric study. *Scientometrics*, **80** (1), 167-194.

Full Text: [2009\Scientometrics80, 167.pdf](2009/Scientometrics80,%20167.pdf)

Abstract: Using 17 fully open access electronic journals published uninterruptedly during 2000-2004 in the field of Library and Information Science the present study investigated the trend of LIS Open Access e-journals’ literature by analysing articles, authors, institutions, countries, subjects, & references. Quantitative content analysis was carried out on the data, data were analysed in order to project literature growth, authorship pattern, gender pattern, cited references pattern and related bibliometric phenomena. The analysis indicates that there were as many as 1636 articles published during 2000-2004 with an average increment of 23.75 articles per year. The authorship pattern indicates that team research has not been very common in LIS OA publishing and male authors were keener than female authors. Authors from academic institutions were paid more interest in OA publishing and most of them were from developed nations. The subject coverage of these OA e-journals was very vast and almost all facets of information and library science were covered in these articles. There were 90.10% of articles of these e-journals contained references and on an average an article contained 24 references. Of these, 38.53% of references were hyperlinked and 87.35% of hyperlinked references were live during investigation. The analysis of data clearly indicates that OA e-journals in LIS are rapidly establishing themselves as a most viable media for scholarly communication.

Keywords: Academic, Access, Analysis, Area, Articles, Authorship, Bibliometric, Citation Analysis, Collaboration, Communication, Content Analysis, Coverage, Female, Gender, Growth, Impact, Information, Information-Science, Institutions, Internet, Journals, Library, Lis, Literature, Male, Media, Research, Science

? Elmacioglu, E. and Lee, D. (2009), Modeling idiosyncratic properties of collaboration networks revisited. *Scientometrics*, **80** (1), 195-216.

Full Text: [2009\Scientometrics80, 195.pdf](2009/Scientometrics80,%20195.pdf)

Abstract: A study on the network characteristics of two collaboration networks constructed from the ACM and DBLP digital libraries is presented. Different types of generic network models and several examples are reviewed and experimented on re-generating the collaboration networks. The results reveal that while these models can generate the power-law degree distribution sufficiently well, they are not able to capture the other two important dynamic metrics: average distance and clustering coefficient. While all current models result in small average distances, none shows the same tendency as the real networks do. Furthermore all models seem blind to generating large clustering coefficients. To remedy these shortcomings, we propose a new model with promising results. We get closer values for the dynamic measures while having the degree distribution still power-law by having link addition probabilities change over time, and link attachment happen within local neighborhood only or globally, as seen in the two collaboration networks.

Keywords: Attachment, Blind, Change, Collaboration, Competition, Complex Networks, Current, Distribution, Dynamic, Evolution, Evolving Networks, Measures, Model, Modeling, Models, Neighborhood, Networks, Small-World Networks, Topology, Values

? Vasconcelos, S.M.R., Sorenson, M.M. and Leta, J. (2009), A new input indicator for the assessment of science & technology research? *Scientometrics*, **80** (1), 217-230.

Full Text: [2009\Scientometrics80, 217.pdf](2009/Scientometrics80,%20217.pdf)

Abstract: Traditional input indicators of research performance, such as research funding, number of active scientists, and international collaborations, have been widely used to assess countries’ publication output. However, while publication in today’s English-only research world requires sound research in readable English, English proficiency may be a problem for the productivity of non-native English-speaking (NNES) countries. Data provided by the Brazilian National Research Council (CNPq) containing the academic profile of 51,223 Brazilian researchers show a correlation between English proficiency and publication output. According to our results, traditional input indicators may fall short of providing an accurate representation of the research performance of NNES developing countries.

Keywords: Academic, Assessment, Correlation, Developing Countries, English, Indicators, International, Language, Performance, Productivity, Profile, Publication, Representation, Research, Science, Technology

? Ketzler, R. and Zimmermann, K.F. (2009), Publications: German economic research institutes on track. *Scientometrics*, **80** (1), 231-252.

Full Text: [2009\Scientometrics80, 231.pdf](2009/Scientometrics80,%20231.pdf)

Abstract: About a decade ago the German Science Council requested a strengthening of academic research at the German economic research institutes to improve the academic foundation of policy advice - the traditional task of the institutes. Based on publications in SSCI journals, research output has since then improved remarkably in scope and quality and has involved an ever rising number of scholars within the institutes. It can be considered to be a substantial success, which should be internationally recognized. The present study demonstrates that for a wide range of different methods the rankings of publication performance is fairly robust. The results are distorted, however, if they are based on a highly selective list of journals as was the case in previous literature.

Keywords: Academic, Economic, Journals, Literature, Methods, Performance, Policy, Quality, Research

? Aminpour, F., Kabiri, P., Otroj, Z. and Keshtkar, A.A. (2009), Webometric analysis of Iranian universities of medical sciences. *Scientometrics*, **80** (1), 253-264.

Full Text: [2009\Scientometrics80, 253.pdf](2009/Scientometrics80,%20253.pdf)

Abstract: There are many researches have been conducted on webometrics, especially the impacts of websites on each other and the web impact factor. However, there are few studies focusing on the websites of Iranian universities. This study analyzed the websites of Iranian universities of medical sciences according to the webometric indicators. In a cross-sectional study, the number of web pages, inlinks, external inlinks and also the overall and absolute web impact factors for Iranian universities of medical sciences with active exclusive websites were calculated and compared using AltaVista search engine. Finally, the websites were ranked based on these webometric indicators. The results showed that the website of Tehran university of medical sciences with 49,300 web pages and 9860 inlinks was ranked first for the size and number of inlinks, while its impact factor was ranked 38th. Rafsanjan UMS with 15 web pages and 211 links had the highest rank for the web impact factor among Iranian universities of medical sciences. The study revealed that Iranian universities of medical sciences did not have much impact on the web and were not well known internationally. The major reason relies on linguistic barriers. Some of them also suffer from technical problems in their web design.

Keywords: Analysis, Barriers, Cross-Sectional, Design, Factors, Impact, Indicators, Medical, Problems, Sites, University, Web, Web Impact Factors

? Buela-Casal, G., Zych, I., Medina, A., Del Jesus, M.I.V., Lozano, S. and Torres, G. (2009), Analysis of the influence of the two types of the journal articles, theoretical and empirical on the impact factor of a journal. *Scientometrics*, **80** (1), 265-282.

Full Text: [2009\Scientometrics80, 265.pdf](2009/Scientometrics80,%20265.pdf)

Abstract: The study discusses the necessity to analyze the influence of theoretical and empirical types of journal articles on the citation impact of Spanish psychology journals. Three of the most representative Spanish psychology journals were selected for the purposes of this study: Papeles del Psiclogo, Analisis y Modificacin de Conducta and Psicothema. Twenty-three psychology journals in Spanish were used as source journals. Altogether, there were sixty-seven issues reviewed for the references and ninety-three issues for the articles. The bibliometricanalysis was conducted by six highly trained psychologists. The results demonstrated differences regarding the percentages of empirical and theoretical articles published in the three examined journals and the number of citations received by them based on the article type. When normalizing the results according to the number of theoretical and empirical articles that were published, it becomes evident that the theoretical articles receive on average twice as many references as the empirical ones. We discuss the importance of this effect on the comparison of journals based on their citation impact and show the evidence that it is only valid to compare journals which publish a similar percentage of theoretical and empirical articles.

Keywords: Citation, Citation-Index Database, Citations, Comparison, Evidence, Guide, Impact, Influence, Journal, Journals, Patterns, Physics, Psychology, Psychopathology, Publication

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Full Text: [2009\Scientometrics80, 283.pdf](2009/Scientometrics80,%20283.pdf)

Abstract: We apply social network analysis to display the characteristics of the networks resulting from bibliographic coupling of journals by the Chinese patent data of United States Patent and Trademark Office (USPTO) between 1995 and 2002. The networks of journals in all fields, the three strongly science-based fields (i.e. Biotechnology, Pharmaceuticals, and Organic Fine Chemistry), and the three weakly science-based fields (i.e. Optics, Telecommunications, and Consumer Electronics), have been analyzed from the global and the ego views, respectively. We study a variety of statistical properties of our networks, including number of actors, number of edges, size of the giant component, density, mean degree, clustering coefficient and the centralization measures of the network. We also highlight some apparent differences in the network structure between the subjects studied. Besides, we use the three centrality measures, i.e. degree, closeness, and betweenness, to identify the important journals in the network of all fields and those strongly science-based networks.

Keywords: Analysis, Chinese, Domains, Journals, Linkages, Measures, Networks, References, Science Base, Scientific Journals, Social, Social Network, Social Network Analysis, Structure, Technology, United States

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Full Text: [2009\Scientometrics80, 303.pdf](2009/Scientometrics80,%20303.pdf)

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Full Text: [2009\Scientometrics80, 305.pdf](2009/Scientometrics80,%20305.pdf), [2009\Scientometrics80, 307-1.pdf](2009/Scientometrics80,%20307-1.pdf)

Abstract: This study is a bibliometric analysis on ocean circulation-related research for the period 1991-2005. Selected documents included “ocean circulation, sea circulation, seas circulation, marine circulation, and circulation ocean” as a part of the title, abstract or keywords. Analyzed parameters included the document type, the article output, the article distribution in journals, the publication activity of countries, and institutes and the authorship. An indicator, citation per publication (CPP) was applied to evaluate the scientific impact of a publication. The relationship between cumulative articles and the year was modeled. Three dominant categories were picked out, and their output increase was modeled. The USA was found to be leading the research with 47% share of total articles, with a CPP up to 5.9. Woods Hole Oceanography Institute in the USA was the most productive institute with a CPP of 6.8. In the citation analysis, a 5th year citation mode was found. A paper life model was applied to compare the cumulative citations increasing rates of different years.

Keywords: Analysis, Atlantic, Authorship, Bibliometric, Categories, Citation, Citations, Distribution, Impact, Journals, Life, Marine, Model, Relationship, Research, USA, WOCE

? Tol, R.S.J. (2009), The h-index and its alternatives: An application to the 100 most prolific economists. *Scientometrics*, **80** (2), 317-324.

Full Text: [2009\Scientometrics80, 317.pdf](2009/Scientometrics80,%20317.pdf)

Abstract: The h-index is a recent but already quite popular way of measuring research quality and quantity. However, it discounts highly-cited papers. The g-index corrects for this, but it is sensitivity to the number of never-cited papers. Besides, h- or g-index-based rankings have a large number of ties. Therefore, this paper introduces two new indices, and tests their performance for the 100 most prolific economists. A researcher has a t-number (f-number) of t (f) if t (f) is the largest number for which it holds that she has t (f) publications for which the geometric (harmonic) average number of citations is at least t (f). The new indices overcome the shortcomings of the old indices.

Keywords: Citations, Indices, Performance, Quality, Research, Sensitivity

? Marchant, T. (2009), An axiomatic characterization of the ranking based on the h-index and some other bibliometric rankings of authors. *Scientometrics*, **80** (2), 325-342.

Full Text: [2009\Scientometrics80, 325.pdf](2009/Scientometrics80,%20325.pdf)

Abstract: In the last few years, many new bibliometric rankings or indices have been proposed for comparing the output of scientific researchers. We propose a formal framework in which rankings can be axiomatically characterized. We then present a characterization of some popular rankings. We argue that such analyses can help the user of a ranking to choose one that is adequate in the context where she/he is working.

Keywords: Bibliometric, Characterization, Context, Indices, Output

? Patterson, M.S. and Harris, S. (2009), The relationship between reviewers’ quality-scores and number of citations for papers published in the journal Physics in Medicine and Biology from 2003-2005. *Scientometrics*, **80** (2), 343-349.

Full Text: [2009\Scientometrics80, 343.pdf](2009/Scientometrics80,%20343.pdf)

Abstract: For each of the years 2003, 2004, and 2005 the number of citations for individual papers published in Physics in Medicine and Biology was compared to the mean quality-score assigned to the manuscript by two independent experts as part of the normal peer review process. A low but statistically significant correlation was found between citations and quality score (1 best to 5 worst) for every year: 2003: -0.227 (p < 0.001), 2004: -0.238 (p < 0.001), 2005: -0.154 (p < 0.01). Papers in the highest quality category (approximately 10 per cent of those published) were cited about twice as often as the average for all papers. Data were also examined retrospectively by dividing the papers published in each year into five citation quintiles. A paper of the highest quality is about ten times more likely to be found in the most cited quintile than in the least cited quintile. By making the assumption that the mean number of citations per paper is a reasonable surrogate for the impact factor, it was also shown that the impact factor for Physics in Medicine and Biology could be increased substantially by rejecting more papers based on the reviewers’ scores. To accomplish this, however, would require a reduction in the acceptance rate of manuscripts from about 50 per cent to near 10 per cent.

Keywords: Acceptance, Articles, Citation, Citations, Correlation, Impact, Individual, Journal, Peer, Process, Quality, Reduction, Relationship, Review

? Wray, K.B. (2009), The salaries of Italian Renaissance professors. *Scientometrics*, **80** (2), 351-357.

Full Text: [2009\Scientometrics80, 351.pdf](2009/Scientometrics80,%20351.pdf)

Abstract: I offer insight into the principles by which the salaries of Italian Renaissance professors were determined. There is a longstanding fascination with the fact that some professors during the Renaissance had extremely high salaries. It has been suggested that at the top of the salary scale were the superstars, professors who could attract many students and raise the prestige of the university. Through an analysis of data on the salaries of professors at Padua in 1422-1423, I argue that much of the differences in salaries can be explained in terms of the stage of career of professors. Those professors who have taught the longest tend to be paid the most. Hence, there is little evidence for the superstar thesis.

Keywords: Analysis, Career, Evidence, Insight, Scale, Students, University

? Liang, L.M. and Rousseau, R. (2009), Bibliometric characteristics of the journal Science: Pre-Koshland, Koshland and post-Koshland period. *Scientometrics*, **80** (2), 359-372.

Full Text: [2009\Scientometrics80, 359.pdf](2009/Scientometrics80,%20359.pdf)

Abstract: During the period 1985-1995 Daniel Koshland was Editor-in-Chief of the journal Science. As such he exerted a huge influence on all aspects related to content and lay-out of the journal. This study compares Science’s bibliometric characteristics between three periods: a pre-Koshland (1975-1984) period, the Koshland period (1985-1995) and the post-Koshland period (1996-2006). The distributions of document types, the country/territory and institutional distribution of authors, co-authorship data and disciplinary impact measured by subject categories of citations are studied. These bibliometric characteristics unveil some of the changes the journal went through under the leadership of Daniel Koshland.

Keywords: Bibliometric, Categories, Changes, Citations, Distribution, Impact, Influence, Journal, Leadership, Rhythm

? Osca-Lluch, J., Velasco, E., Lopez, M. and Haba, J. (2009), Co-authorship and citation networks in Spanish history of science research. *Scientometrics*, **80** (2), 373-383.

Full Text: [2009\Scientometrics80, 373.pdf](2009/Scientometrics80,%20373.pdf)

Abstract: This paper studies cooperation patterns in Spain between science history researchers by analysing co-authorship in the scientific publications of the Social Science Citation Index (SSCI) and the Science Citation Index (SCI) databases.

Keywords: Citation, Cooperation, Databases, History, Networks, Patterns, Research, SCI, Science, Spain

? Blatt, E.M. (2009), Differentiating, describing, and visualizing scientific space: A novel approach to the analysis of published scientific abstracts. *Scientometrics*, **80** (2), 385-406.

Full Text: [2009\Scientometrics80, 385.pdf](2009/Scientometrics80,%20385.pdf)

Abstract: This paper will develop and demonstrate a novel method for analyzing scientific indexes called Latent Semantic Differentiation. Using two distinct datasets comprised of scientific abstracts, it will demonstrate the procedure’s ability to identify the dominant themes, cluster the articles accordingly, visualize the results, and provide a qualitative description of each cluster. Combined, the analyses will highlight the utility of the procedure for scientific document indexing, structuring university departments, facilitating grant administration, and augmenting ongoing research on scientific citation. Because the procedure is extensible to any textual domain, there are numerous avenues for continued research both within the sciences and beyond.

Keywords: Ability, Administration, Analysis, Citation, Cluster, Cocitation, Evolution, Information, Knowledge, Latent Semantic Analysis, Networks, Novel, Qualitative, Research, Science, Space, Topics, University, Word Analysis

? Aleixandre-Benavent, R., Gonzalez-Alcaide, G., Miguel-Dasit, A., Navarro-Molina, C. and Valderrama-Zurian, J.C. (2009), Full-text publications in peer-reviewed journals derived from presentations at three ISSI conferences. *Scientometrics*, **80** (2), 407-418.

Full Text: [2009\Scientometrics80, 407.pdf](2009/Scientometrics80,%20407.pdf)

Abstract: This study analyses the bibliometric characteristics of the presentations at the 5th, 8th and 10th Conferences of the International Society for Scientometrics and Informetrics, which were subsequently published in peer-reviewed journals covered by the Science Citation Index, Social Science Citation Index and LISA databases. 31.7% of all the papers presented at the three conferences were published. Scientometrics was the journal that published the highest proportions. A low rate of publication deprives researchers of potentially interesting results and points up the role of the ISSI Conference proceedings as a primary source of information.

Keywords: Abstracts, Bibliometric, Citation, Databases, Fate, Information, Journal, Journals, Meetings, Publish, Rates, Subsequent Publication

? Sooryamoorthy, R. (2009), Collaboration and publication: How collaborative are scientists in South Africa? *Scientometrics*, **80** (2), 419-439.

Full Text: [2009\Scientometrics80, 419.pdf](2009/Scientometrics80,%20419.pdf)

Abstract: Using bibliographic records from the Science Citation Index, the paper examines the publication of South African scientists. The analysis shows that collaboration research in South Africa has been growing steadily and the scientists are highly oriented towards collaborative rather than individualistic research. International collaboration is preferred to domestic collaboration while publication seems to be a decisive factor in collaboration. The paper also looks at the collaboration dimensions of partnering countries, sectors and disciplines, and examines how collaboration can be predicted by certain publication variables. Characteristic features are evident in both the degree and nature of collaboration which can be predicted by the number of countries involved, number of partners and the fractional count of papers.

Keywords: Academic Research, Africa, Analysis, Authorship, Collaboration, Countries, Disciplines, Indicators, International Research Collaboration, Networks, Partners, Patterns, Productivity, Profiles, Research, Science, South Africa

? Azagra-Caro, J.M., Fernandez-de-Lucio, I., Perruchas, F. and Mattsson, P. (2009), What do patent examiner inserted citations indicate for a region with low absorptive capacity? *Scientometrics*, **80** (2), 441-455.

Full Text: [2009\Scientometrics80, 441.pdf](2009/Scientometrics80,%20441.pdf)

Abstract: Most studies of patents citations focus on national or international contexts, especially contexts of high absorptive capacity, and employ examiner citations. We argue that results can vary if we take the region as the context of analysis, especially if it is a region with low absorptive capacity, and if we study applicant citations and examiner-inserted citations separately. Using a sample from the Valencian Community (Spain), we conclude that (i) the use of examiner-inserted citations as a proxy for applicant citations, (II) the interpretation of non-patent references as indicators of science-industry links, and (iii) the traditional results for geographical localization are not generalizable to all regions with low absorptive capacity.

Keywords: Analysis, Capacity, Citations, Context, Flows, Indicators, Innovation Systems, International, Knowledge Spillovers, Localization, Region, Science, Spain, Technology

? Cantu, A.G. and Ausloos, M. (2009), Organizational and dynamical aspects of a small network with two distinct communities: Neo-creationists vs. Evolution Defenders. *Scientometrics*, **80** (2), 457-472.

Full Text: [2009\Scientometrics80, 457.pdf](2009/Scientometrics80,%20457.pdf)

Abstract: Social impacts and degrees of organization inherent to opinion formation for interacting agents on networks present interesting questions of general interest from physics to sociology. We present a quantitative analysis of a case implying an evolving small size network, i.e. that inherent to the ongoing debate between modern creationists (most are Intelligent Design (ID) proponents (IDP) and Darwin’s theory of Evolution Defenders (DED)). This study is carried out by analyzing the structural properties of the citation network unfolded in the recent decades by publishing works belonging to members of the two communities. With the aim of capturing the dynamical aspects of the interaction between the IDP and DED groups, we focus on two key quantities, namely, the degree of activity of each group and the corresponding degree of impact on the intellectual community at large. A representative measure of the former is provided by the rate of production of publications (RPP), whilst the latter can be assimilated to the rate of increase in citations (RIC). These quantities are determined, respectively, by the slope of the time series obtained for the number of publications accumulated per year and by the slope of a similar time series obtained for the corresponding citations. The results indicate that in this case, the dynamics can be seen as geared by triggered or damped competition. The network is a specific example of marked heterogeneity in exchange of information activity in and between the communities, particularly demonstrated through the nodes having a high connectivity degree, i.e. opinion leaders.

Keywords: Analysis, Belonging, Citation, Citations, Communities, Community, Competition, Connectivity, Dynamics, Exchange, Group, Heterogeneity, Impact, Information, Intelligent Design, Interaction, Key, Models, Modern, Networks, Organization, Population, Production, Quantitative, Theory

? Gupta, B. and Dhawan, S. (2009), Status of India in science and technology as reflected in its publication output in the Scopus international database, 1996-2006. *Scientometrics*, **80** (2), 473-490.

Full Text: [2009\Scientometrics80, 473.pdf](2009/Scientometrics80,%20473.pdf)

Abstract: This paper seeks to provide current indicators on Indian science and technology for measuring the country’s progress in research. The study uses for the purpose 11 years publications data on India and top 20 productive countries as drawn from the Scopus database for the period 1996 to 2006. The study examines country performance on several measures including country publication share in the world research output, country publication share in various subjects in the national context and in the global context, patterns of research communication in core Indian domestic and international journals, geographical distribution of publications, share of international collaborative papers at the national level as well as across subjects and characteristics of high productivity institutions, scientists and cited papers. The paper also compares the similarity of Indian research profile with top 20 productive countries. The findings of the study should be of special significance to the planners & policy-makers as they have implications for the long term S&T planning of the country.

Keywords: Citation-Index, Communication, Context, Current, Database, Decline, Distribution, India, Indicators, Institutions, International, Journals, Measures, Patterns, Performance, Planning, Productivity, Profile, Research, Science, Similarity, Technology

? Hengl, T., Minasny, B. and Gould, M. (2009), A geostatistical analysis of geostatistics. *Scientometrics*, **80** (2), 491-514.

Full Text: [2009\Scientometrics80, 491.pdf](2009/Scientometrics80,%20491.pdf)

Abstract: The bibliometric indices of the scientific field of geostatistics were analyzed using statistical and spatial data analysis. The publications and their citation statistics were obtained from the Web of Science (4000 most relevant), Scopus (2000 most relevant) and Google Scholar (5389). The focus was on the analysis of the citation rate (CR), i.e. number of citations an author or a library item receives on average per year. This was the main criterion used to analyze global trends in geostatistics and to extract the Top 25 most-cited lists of the research articles and books in geostatistics. It was discovered that the average citation rate for geostatisticians has stabilized since 1999, while the authors’ n-index seems to have declined ever since. One reason for this may be because there are more and more young authors with a lower n-index. We also found that the number of publications an author publishes explains only 60% of the variation in the citation statistics and that this number progressively declines for an author with a lower number of publications. Once the geographic location is attached to a selection of articles, an isotropic Gaussian kernel smoother weighted by the CR can be used to map scientific excellence around the world. This revealed clusters of scientific excellence around locations such as Wageningen, London, Utrecht, Hampshire, UK, Norwich, Paris, Louvain, Barcelona, and Zurich (Europe), Stanford, Ann Arbor, Tucson, Corvallis, Seattle, Boulder, Montreal, Baltimore, Durham, Santa Barbara and Los Angeles (North America), and Canberra, Melbourne, Sydney, Santiago (Chile), Taipei, and Beijing (other continents). Further correlation with socio-economic variables showed that the spatial distribution of CRs in geostatistics is independent of the night light image (which represents economic activity) and population density. This study demonstrates that the commercial scientific indexing companies could enhance their service by assigning the geographical location to library items to allow spatial exploration and analysis of bibliometric indices.

Keywords: Analysis, Bibliometric, Chile, Citation, Citations, Correlation, Data Analysis, Distribution, Economic, Europe, Geostatistics, Google Scholar, h-Index, Image, Indices, Melbourne, Population, Research, Selection, Series, Service, Socio-Economic, Socioeconomic, Spatial, Spatial Data, Spatial Distribution, Statistics, Trends, UK

? Andrade, A., Gonzalez-Jonte, R. and Campanario, J.M. (2009), Journals that increase their impact factor at least fourfold in a few years: The role of journal self-citations. *Scientometrics*, **80** (2), 515-528.

Full Text: [2009\Scientometrics80, 515.pdf](2009/Scientometrics80,%20515.pdf)

Abstract: The aim of this study was to ascertain the possible effect of journal self-citations on the increase in the impact factors of journals in which this scientometric indicator rose by a factor of at least four in only a few years. Forty-three journals were selected from the Thomson-Reuters (formerly ISI) Journal Citation Reports as meeting the above criterion. Eight journals in which the absolute number of citations was lower than 20 in at least two years were excluded, so the final sample consisted of 35 journals. We found no proof of widespread manipulation of the impact factor through the massive use of journal self-citations.

Keywords: Citations, Factors, Impact, Index, Journal, Journals, Labeled Editorial Material, Quality, Science

? Goncalves, R.R., Kieling, C., Bressan, R.A., Mari, J.J. and Rohde, L.A. (2009), The evaluation of scientific productivity in Brazil: An assessment of the mental health field. *Scientometrics*, **80** (2), 529-537.

Full Text: [2009\Scientometrics80, 529.pdf](2009/Scientometrics80,%20529.pdf)

Abstract: Brazilian scientific production has increased significantly over the last decade, and mental health has been a leading research field in the country, with a growing number of articles published in high quality international journals. This article analyses the scientific output of mental health research between 2004 and 2006 and estimates individual research performance based on four different strategies. A total of 106 mental health scientists were included in the analysis, together they published 1,209 articles indexed in Medline or ISI, with over 65% of the production in journals with impact factor a parts per thousand yen1. Median impact factor of publications was 2. Spearman correlation coefficient showed a large positive correlation between all four different measures used to estimate individual research output. Ten investigators were together responsible for almost 30% of the articles published in the period, whereas 65% of the sample contributed with less than 10 articles.

Keywords: Analysis, Assessment, Brazil, Correlation, Correlation Coefficient, Evaluation, Health, Impact, Individual, International, International Visibility, Journals, Measures, Mental Health, Performance, Production, Productivity, Quality, Research, Science, Strategies, Universities

? Danell, J.A.B. and Danell, R. (2009), Publication activity in complementary and alternative medicine. *Scientometrics*, **80** (2), 539-551.

Full Text: [2009\Scientometrics80, 539.pdf](2009/Scientometrics80,%20539.pdf)

Abstract: In this article we analyse how research on complementary and alternative medicine (CAM) break through into one established scientific arena, namely academic journals. With help from bibliometric methods we analyse publication of CAM articles, in the Medline database, during the period 1966-2007. We also analyse the general content of the articles and in what journals they get published. We conclude that the publication activity of CAM articles increases rapidly, especially in the late 1990s, and that the changing growth rate is not due to the general expansion of Medline. The character of CAM articles has changed towards more clinical oriented research, especially in subfields such as acupuncture and musculoskeletal manipulations. CAM articles are found both in core clinical journals and in specialized CAM journals. Even though a substantial part of the articles are published in CAM journals, we conclude that the increasing publication activity is not restricted to the expansion of these specialized journals.

Keywords: Academic, Acupuncture, Alternative Medicine, Australia, Bibliometric, Clinical, Complementary And Alternative Medicine, Database, Growth, Growth Rate, Journals, Methods, Population, Prevalence, Research, Science, United-States

? Schubert, A. and Schubert, M. (2009), Outperform your neighbors. *Scientometrics*, **80** (2), 553-558.

Full Text: [2009\Scientometrics80, 553.pdf](2009/Scientometrics80,%20553.pdf)

Abstract: A new framework of international comparisons is advised: each country is gauged against its bordering countries. This approach has several undeniable drawbacks, but by revealing some otherwise hidden patterns, advantageously supplements the customary comparison methods.

Keywords: Comparison, International, International Comparisons, Methods, Neighbors, Patterns

? Kumari, G.L. (2009), Synthetic Organic Chemistry research: Analysis by scientometric indicators. *Scientometrics*, **80** (3), 559-570.

Full Text: [2009\Scientometrics80, 559.pdf](2009/Scientometrics80,%20559.pdf)

Abstract: Present study analyses the research output and impact in Synthetic Organic Chemistry (SOC) during 1998-2004 applying standardized scientometric indicators. Volume of research publications and their citations presented as percentage world share is illustrative of trending pattern against time. Adopting relative indicators - Absolute Citation Impact (ACI) and Relative Citation Impact (RCI), a cross national comparison is attempted at three levels of aggregations - global, Asian and Indian. Based on this analysis, it is concluded that G7 nations, being leaders for the volume of literature published and citations attracted are showing a decreasing trend over the years probably due to shifting and diversification of their research efforts to other emerging research fronts. In contrast smaller nations though publishing low volume but high quality research are represented by Netherlands. This country credited with only 1.12% world share of publications has recorded highest Absolute Citation Impact and recorded higher than world average Relative Citation Impact. In Asian region, between the two developing economies India and China, China out-performed India qualitatively by accounting higher citation share, higher Absolute Citation Impact (ACI) and higher Relative Citation Impact (RCI).

? He, T.W. (2009), International scientific collaboration of China with the G7 countries. *Scientometrics*, **80** (3), 571-582.

Full Text: [2009\Scientometrics80, 571.pdf](2009/Scientometrics80,%20571.pdf)

Abstract: Collaboration is one of the remarkable characteristics of contemporary basic research. Using bibliometric method, we quantitatively analyze international collaboration publication output between China and the G7 countries based on Science Citation Index. The results indicate that international collaboration publication output between China and the G7 countries has shown exponential growth aroused by the growth of science in China. USA is the most important collaboration country and the international collaboration between China and the G7 countries display differences at each research field.

Keywords: Co-Authorship, Impact, Nations, Patterns, Science, Subfields

? He, T.W. and Liu, W. (2009), The internationalization of Chinese scientific journals: A quantitative comparison of three chemical journals from China, England and Japan. *Scientometrics*, **80** (3), 583-593.

Full Text: [2009\Scientometrics80, 583.pdf](2009/Scientometrics80,%20583.pdf)

Abstract: Scientific journals play an important role in international academic information exchange. Their international performance can be evaluated through the comparison of the geographical distribution patterns of authors, citations and subscriptions. In this study we analyzed 3 journals, i.e., Chinese Chemical Letters (China), Chemical Communications (England) and Chemistry Letters (Japan), for their regional distribution patterns of the editorial board members, the authors database, and the citation regions, using the bibliometric method, on the basis of the Web of Science. The results show that, compared with international journals, the Chinese Chemical Letters lags behind in all aspects.

Keywords: Academic Journals, Communication, Science-Citation-Index

? Chung, Y.M., Yu, S.Y., Kim, Y.K. and Kim, S.Y. (2009), Characteristics and link structure of a national scholarly Web space: The case of South Korea. *Scientometrics*, **80** (3), 595-612.

Full Text: [2009\Scientometrics80, 595.pdf](2009/Scientometrics80,%20595.pdf)

Abstract: This study performs a webometric analysis to explore the communication characteristics of scientific knowledge in a national scholarly Web space comprising top ranking universities and government supported research institutions in South Korea. We found significant differences in scholarly communication activity as well as linking behavior among different subspaces in addition to institutional differences. We also found the usefulness of the ADM approach in analyzing the metric data containing extreme outliers and discovered the directory model as the most appropriate. Page counts were found significantly correlated with inlinks as well as with outlinks at the directory level in the whole scholarly Web space.

Keywords: Academic Subjects, Canadian Universities, Citations, Classification, Departments, Disciplinary, Impact Factors, Online Impact, Science, Site Interlinking

? Ruane, F.P. and Tol, R.S.J. (2009), A Hirsch measure for the quality of research supervision, and an illustration with trade economists. *Scientometrics*, **80** (3), 613-624.

Full Text: [2009\Scientometrics80, 613.pdf](2009/Scientometrics80,%20613.pdf)

Abstract: There is a growing literature measuring research excellence in economics. The h-index is noteworthy in combining quantity and research quality in a single measure of researcher excellence, and its ability to be extended to measure the quantity and quality of the researchers in a department. We extend the use of the first successive h-index further to measure the quality of graduate education, specifically excellence in research supervision, based on publication and citation data for individual researchers ascribed to their graduate supervisors.

Keywords: Indexes, Scientific-Research Output

? Hayati, Z. and Ebrahimy, S. (2009), Correlation between quality and quantity in scientific production: A case study of Iranian organizations from 1997 to 2006. *Scientometrics*, **80** (3), 625-636.

Full Text: [2009\Scientometrics80, 625.pdf](2009/Scientometrics80,%20625.pdf)

Abstract: In order to prevent the formation of a gap between the quality and quantity in Iranian scientific publications, this study makes an effort to analyze Iranian scientific publications indexed on the ISI Web of Science database using quantitative and qualitative scientometrics criteria over a ten year period. As a first step, all Iranian institutes were divided into three categories, universities, research institutes and other organizations. Then they were compared according to quantitative and qualitative criteria. Second, the correlation between the quality and quantity of the publications was measured. The research findings indicated that, according to qualitative criteria (citation, citation impact and percentage of cited documents) there are no meaningful differences among the three groups, while regarding quantitative criterion(number of papers), universities rank higher than the other two groups. The results also indicated that there is a positive and meaningful correlation among qualitative and quantitative criteria in the scholarly scientific publications conducted by Iranian organizations. In other words, in Iranian organizations the quality of publications increases as their quantity increases. The comparison of magnitude of correlation between these two criteria in the three categories reveals the fact that the correlation between number of papers and citations criterion in research institutes is stronger than the other two groups.

Keywords: Collaboration, Universities

? Chen, Y.S. and Chang, K.C. (2009), Using neural network to analyze the influence of the patent performance upon the market value of the US pharmaceutical companies. *Scientometrics*, **80** (3), 637-655.

Full Text: [2009\Scientometrics80, 637.pdf](2009/Scientometrics80,%20637.pdf)

Abstract: This study applies the artificial neural network technique to explore the influence of quantitative and qualitative patent indicators upon market value of the pharmaceutical companies in US. The results show that Herfindahl-Hirschman Index of patents influences negatively market value of the pharmaceutical companies in US, and their technological independence positively affects their market value. In addition, this study also finds out that patent citations of the American pharmaceutical companies have an inverse U-shaped effect upon their market value.

Keywords: Citations, Classification, Empirical-Analysis, Firms, Industry, Innovation, Portfolios, Predictions, Research-and-Development, Technology

? Neff, M.W. and Corley, E.A. (2009), 35 years and 160,000 articles: A bibliometric exploration of the evolution of ecology. *Scientometrics*, **80** (3), 657-682.

Full Text: [2009\Scientometrics80, 657.pdf](2009/Scientometrics80,%20657.pdf)

Abstract: We utilize the bibliometric tool of co-word analysis to identify trends in the methods and subjects of ecology during the period 1970-2005. Few previous co-word analyses have attempted to analyze fields as large as ecology. We utilize a method of isolating concepts and methods in large datasets that undergo the most significant upward and downward trends. Our analysis identifies policy-relevant trends in the field of ecology, a discipline that helps to identify and frame many contemporary policy problems. The results provide a new foundation for exploring the relations among public policies, technological change, and the evolution of science priorities.

Keywords: Co-Word Analysis, Field, Policy, Problem Choice, Program, Representations, Science Maps

? McMillan, G.S. (2009), Gender differences in patenting activity: An examination of the US biotechnology industry. *Scientometrics*, **80** (3), 683-691.

Full Text: [2009\Scientometrics80, 683.pdf](2009/Scientometrics80,%20683.pdf)

Abstract: The gender gap in science and technology has received considerable attention by both researchers and policy makers. In an effort to better understand the quantity, quality, and underlying characteristics of female research efforts, I integrate three existing databases to uncover how female patenting activities differ from men’s in the US biotechnology industry. Data on how much science the patents build upon, the author institutions of that science, and who funded the papers in which the science appears are all examined. In addition, using the NBER Patent Citation Data Files, I propose a possible gender-based life cycle model for patenting activity. The policy implications of my findings are also discussed.

Keywords: Market, Public Science

? Robert, C., Wilson, C.S., Donnadieu, S., Gaudy, J.F. and Arreto, C.D. (2009), Analysis of the medical and biological pain research literature in the European Union: A 2006 snapshot. *Scientometrics*, **80** (3), 693-716.

Full Text: [2009\Scientometrics80, 693.pdf](2009/Scientometrics80,%20693.pdf)

Abstract: This study analyzed 2443 papers published in 2006 by European Union authors on pain-related research. Five EU countries (the UK, Germany, Italy, the Netherlands and France) each published > 200 papers while three countries (Cyprus, Malta and Estonia) published none, socio-economic indicators were related to each country’s productivity. The 2443 papers were published in 592 journals and Cephalalgia, Pain and European Journal of Pain were the most prolific. Publications were also analyzed for intra- versus inter-EU/non-EU collaborations and subdisciplines profiles in Clinical Medicine and the Life Sciences for the World, USA, EU and the top-four EU countries were compared.

Keywords: Bibliometric Evaluation, Epidemiology, General-Population, Impact, Low-Back-Pain, Neurological Research, Primary-Care, Publications, Scientific Production, World

? Chu, H.T. and Xu, C. (2009), Web 2.0 and its dimensions in the scholarly world. *Scientometrics*, **80** (3), 717-729.

Full Text: [2009\Scientometrics80, 717.pdf](2009/Scientometrics80,%20717.pdf)

Abstract: A bibliometric analysis was performed on a set of 1718 documents relating to Web 2.0 to explore the dimensions and characteristics of this emerging field. It has been found that Web 2.0 has its root deep in social networks with medicine and sociology as the major contributing disciplines to the scholarly publications beyond its technology backbone - information and computer science. Terms germane to Web 2.0, extracted from the data collected in this study, were also visualized to reflect the very nature of this rising star on the Internet. Web 2.0, according to the current research, is of the user, by the user, and more importantly, for the user.

Keywords: Knowledge

? Daizadeh, I. (2009), An intellectual property-based corporate strategy: An R&D spend, patent, trademark, media communication, and market price innovation agenda. *Scientometrics*, **80** (3), 731-746.

Full Text: [2009\Scientometrics80, 731.pdf](2009/Scientometrics80,%20731.pdf)

Abstract: An intellectual property (IP)-centric, communication-based Innovation Agenda is proposed and investigated. The agenda, which is aligned with IP legal prescription, is defined as follows: the firm’s R&D expenditure is captured within products. The firm applies for a patent and files a trademark to protect its interests in the ‘patentable’ product, and issues a media communication, which may alter the perception of future cash flows, and thereby market price. Upon patent issuance and trademark registration, the firm will then seek another media communication. Spearman (partial) correlation analysis shows strong correlation among the various proxy metrics suggesting that the model basis may exist. The model proposes a novel link among national socioeconomic metrics, corporate strategy, and the technology based innovative firm. Finally, the model supports the inclusion of trademark and media communications data to be considered in socioeconomic modeling.

Keywords: Information, Statistics, Stock-Market

? Romero, A.G., Cortes, J.N., Escudero, C., Lopez, J.A.F. and Moreno, J.A.C. (2009), Measuring the influence of clinical trials citations on several bibliometric indicators. *Scientometrics*, **80** (3), 747-760.

Full Text: [2009\Scientometrics80, 747.pdf](2009/Scientometrics80,%20747.pdf)

Abstract: The practice of publishing clinical trials in scientific journals is common, although not without its critics. This study aims to measure the effect of clinical trials citations on several bibliometric indicators: citations per document (CD), journal impact factor (JIF), relative h-index (RhI) and strike rate index (SRI). We select all the citable documents published in the NEJM, Lancet, JAMA, AIM and BMJ, for the period 2000-2004, and record the citations received by those papers from 2000 to 2005. Our results show that clinical trials have a CD significantly higher than those for conventional papers, JIF is lower when clinical trials are excluded, especially for NEJM, Lancet and JAMA. Finally, both RhI and SRI seem to be unaffected by clinical trials citations.

Keywords: Clinical Trials, Impact Factor, Index, Medical Journals, Pharmaceutical Companies, Self-Citations

? Torres-Salinas, D., Lopez-Cozar, E.D. and Jimenez-Contreras, E. (2009), Ranking of departments and researchers within a university using two different databases: Web of Science versus Scopus. *Scientometrics*, **80** (3), 761-774.

Full Text: [2009\Scientometrics80, 761.pdf](2009/Scientometrics80,%20761.pdf)

Abstract: In this work, we compare the difference in the number of citations compiled with Scopus as opposed to the Web of Science (WoS) with the aim of analysing the agreement among the citation rankings generated by these databases. For this, we analysed the area of Health Sciences of the University of Navarra (Spain), composed of a total of 50 departments and 864 researchers. The total number of published works reflected in the WoS during the period 1999-2005 was 2299. For each work, the number of citations in both databases was recorded. The results indicate that the works received 14.7% more citations in Scopus than in WoS. In the departments, the difference was greater in the clinical ones than in the basic ones. In the case of the rankings of citations, it was found that both databases generate similar results. The Spearman and Kendall-Tau coefficients were higher than 0.9. It was concluded that the difference in the number of citations found did not correspond to the difference of coverage of WoS and Scopus.

? Jonkers, K. (2009), Emerging ties: Factors underlying China’s co-publication patterns with Western European and North American research systems in three molecular life science subfields. *Scientometrics*, **80** (3), 775-795.

Full Text: [2009\Scientometrics80, 775.pdf](2009/Scientometrics80,%20775.pdf)

Abstract: This paper analyses the changing geographic balance in China’s international co-publications in general and in three molecular life science subfields in particular. No support is found for the expectation that intensive, designated institutional support for research collaboration in the form of joint laboratories has a positive impact on the number of co-publications at the systemic level. The size of partner research systems, and since the turn of the century the relative size of overseas Chinese scientific communities in various partner countries do help to explain the observed geographic variations in the share of China’s international co-publications. The paper concludes by discussing some of the potential factors underlying the perceived change in the dynamics of international co-publication behavior of mainland Chinese scientists since the turn of the century.

Keywords: Scientific Collaboration

? Cervantes, V.H., Santana, A.C., Guilera, G. and Gomez-Benito, J. (2009), Hierarchical linear models in psychiatry: A bibliometric study. *Scientometrics*, **80** (3), 797-808.

Full Text: [2009\Scientometrics80, 797.pdf](2009/Scientometrics80,%20797.pdf)

Abstract: Development of research methods requires a systematic review of their status. This study focuses on the use of Hierarchical Linear Modeling methods in psychiatric research. Evaluation includes 207 documents published until 2007, included and indexed in the ISI Web of Knowledge databases, analyses focuses on the 194 articles in the sample. Bibliometric methods are used to describe the publications patterns. Results indicate a growing interest in applying the models and an establishment of methods after 2000. Both Lotka’s and Bradford’s distributions are adjusted to the data.

Keywords: Effects Regression-Models, Environment, Index, Journals, Lotka Law, Methodology, Neighborhood, Schizophrenia

? Randic, M. (2009), Citations versus limitations of citations: beyond Hirsch index. *Scientometrics*, **80** (3), 809-818.

Full Text: [2009\Scientometrics80, 809.pdf](2009/Scientometrics80,%20809.pdf)

Abstract: It appears popular, particularly among science administrators, to use citations and various citation measures for ranking scientists, as if such exercises would reflect the scientific potential of the persons considered. In recent time the Hirsch index h in particular has obtained visibility in this respect in view of its simplicity. We consider a possible extension of the concept of selective citations, which in fact is innate to the h index, and propose a simple generalization, indices H and Q, which to a degree supplement the information accompanying the evaluation of h. The H index keeps record of the “history” of citations and the quotient Q = H/h is a measure for the quality of a scientist based on the history of his/her citations.

? Deineko, V.G. and Woeginger, G.J. (2009), A new family of scientific impact measures: The generalized Kosmulski-indices. *Scientometrics*, **80** (3), 819-826.

Full Text: [2009\Scientometrics80, 819.pdf](2009/Scientometrics80,%20819.pdf)

Abstract: This article introduces the generalized Kosmulski-indices as a new family of scientific impact measures for ranking the output of scientific researchers. As special cases, this family contains the well-known Hirsch-index h and the Kosmulski-index h ((2)). The main contribution is an axiomatic characterization that characterizes every generalized Kosmulski-index in terms of three axioms.

Keywords: h-Index, Hirsch-Index, Ranking

? Castro-Martinez, E., Jimenez-Saez, F. and Ortega-Colomer, F.J. (2009), Science and technology policies: A tale of political use, misuse and abuse of traditional R&D indicators. *Scientometrics*, **80** (3), 827-844.

Full Text: [2009\Scientometrics80, 827.pdf](2009/Scientometrics80,%20827.pdf)

Abstract: Future political priorities for science and technology (S&T) policy formulation usually rest on a rather simplistic interpretation of past events. This can lead to serious errors and distortions and can negatively affect the innovation system. In this article we try to highlight the riskiness involved in policy making based on traditional R&D indicators and trends. We would emphasise that this approach does not take account of structural aspects crucial for the analysis of the innovation system. We examine the implications for science, technical and human resources policies of the political challenge of R&D convergence in a peripheral EU region. Three scenarios are developed based on application of the same criteria to the trends observed in traditional R&D input indicators.

Keywords: Economy, Innovation

? Lecocq, C. and Van Looy, B. (2009), The impact of collaboration on the technological performance of regions: time invariant or driven by life cycle dynamics? *Scientometrics*, **80** (3), 845-865.

Full Text: [2009\Scientometrics80, 845.pdf](2009/Scientometrics80,%20845.pdf)

Abstract: Increasingly, collaboration between firms as well as science-industry interactions are being considered as important for technology development. Yet, few attempts have been made to analyze the contribution of collaboration, taking into account different stages of the technology life cycle. Our analysis, based on a panel of 197 regions in the EU-15 and Switzerland (time period 1978-2001), provides evidence that, in the field of biotechnology, science-industry collaboration contributes to better technological performance of regions both during the emerging phases (1978-1990) and the growth stages (1991-1999) of the life cycle. Collaboration between industrial partners also contributes to the technological performance of regions during the first phase but is less pronounced during later phases of the technology life cycle. Moreover, the analysis reveals that, as technologies develop over time, the impact of local collaboration is mitigated in favor of collaboration that has an international dimension. This holds true for both science-industry interactions and for collaboration between firms. In consequence, our findings underscore the relevance of incorporating life cycle dynamics (of technologies) when studying the nature and impact of collaboration on the technological performance of regions.

Keywords: Academic Research, Cooperation, Innovation, Knowledge Spillovers, Patent Statistics, Research-and-Development, Science, Strategic Alliances, University-Research

? Glänzel, W. (2009), Peter Vinkler and Michel Zitt win the 2009 Derek John de Solla Price Medal. *Scientometrics*, **81** (1), 1-5.

Full Text: [2009\Scientometrics81, 1.pdf](2009/Scientometrics81,%201.pdf)

? Sotudeh, H. and Horri, A. (2009), Countries positioning in open access journals system: An investigation of citation distribution patterns. *Scientometrics*, **81** (1), 7-31.

Full Text: [2009\Scientometrics81, 7.pdf](2009/Scientometrics81,%207.pdf)

Abstract: By their widespread availability and dissemination through open access media, scholarly outputs witness an improved visibility supposed to cause a better citation performance. However, due to the existence of the Matthew effect in science system, which affects users’ perceptions of quality, ultimate effects of the enhanced visibility on different entities are obscure. Moreover, different attitudes towards open access give rise to a more strong quality dynamics in the open access world. Aiming to explore the consequence of the interaction between visibility and quality dynamics, this study investigates countries positioning in open access journals. The results show that the world’s countries welcome open access pattern whether by submitting to or publishing open access journals. A large proportion of the enduring, prestigious open access journals are published by scientifically proficient and developing nations, emphasizing their successful commitment to maintain the undertaken role. The results of the citation analysis highlight national inequalities regarding citation distributions among countries contributing to the journals within the system and within individual disciplines in the system. Well-performing countries mainly consist of advanced ones, however, some lessdeveloped nations are found to perform well in the journal system.

Keywords: Electronic Preprints, Impact, Life Sciences, Matthew Core Journals, National Performances, Newest Version, Publication Output, Scholarly Communication, Science Fields, World-Wide-Web

? Ma, R.M., Dai, Q.B., Ni, C.Q. and Li, X.L. (2009), An author co-citation analysis of information science in China with Chinese Google Scholar search engine, 2004-2006. *Scientometrics*, **81** (1), 33-46.

Full Text: [2009\Scientometrics81, 33.pdf](2009/Scientometrics81,%2033.pdf)

Abstract: Author co-citation analysis (ACA) is an important method for discovering the intellectual structure of a given scientific field. Since traditional ACA was confined to ISI Web of Knowledge (WoK), the co-citation counts of pairs of authors mainly depended on the data indexed in WoK. Fortunately, Google Scholar has integrated different academic databases from different publishers, providing an opportunity of conducting ACA in wider a range. In this paper, we conduct ACA of information science in China with the Chinese Google Scholar. Firstly, a brief introduction of Chinese Google Scholar is made, including retrieval principles and data formats. Secondly, the methods used in our paper are given. Thirdly, 31 most important authors of information science in China are selected as research objects. In the part of empirical study, factor analysis is used to find the main research directions of information science in China. Pajek, a powerful tool in social network analysis, is employed to visualize the author co-citation matrix as well. Finally, the resemblances and the differences between China and other countries in information science are pointed out.

Keywords: Pearsons-R

? Molatudi, M., Molotja, N. and Pouris, A. (2009), A bibliometric study of bioinformatics research in South Africa. *Scientometrics*, **81** (1), 47-59.

Full Text: [2009\Scientometrics81, 47.pdf](2009/Scientometrics81,%2047.pdf)

Abstract: This paper reports on the practises of bioinformatics research in South Africa using bibliometric techniques. The search strategy was designed to cover the common concepts in biological data organisation, retrieval and analysis, the development and application of tools and methodologies in biological computation, and related subjects in genomics and structural bioinformatics. The South African literature in bioinformatics has grown by 66.5% between 2001 and 2006. However, its share of world production is not on par with comparator countries, Brazil, India and Australia.

Keywords: Biotechnology, Impact

? Pereira, C.A. and Bazi, R.E.R. (2009), Flow and social relationships of knowledge in science, technology and innovation: A patentometric study of UNICAMP’s technological production. *Scientometrics*, **81** (1), 61-72.

Full Text: [2009\Scientometrics81, 61.pdf](2009/Scientometrics81,%2061.pdf)

Abstract: The object is to identify the flux of information and get to know the socio-spatial and socioinstitutional dimensions of knowledge in the process of innovation, and to be able to visualize the impact and cognitive relationships of the sources of information used in the production of patents, as well as interactions and social cooperation that exists between the local innovative agents of The State University of Campinas. The research is of an exploratory nature with a case study design, in order to find out, by means of patentometric indicators, the flow and social relations characterized by cognitive and institutional aspects of local and regional knowledge based on the production of the Institution’s patents.

Keywords: Indicators

? Tseng, Y.H., Lin, Y.I., Lee, Y.Y., Hung, W.C. and Lee, C.H. (2009), A comparison of methods for detecting hot topics. *Scientometrics*, **81** (1), 73-90.

Full Text: [2009\Scientometrics81, 73.pdf](2009/Scientometrics81,%2073.pdf)

Abstract: In scientometrics for trend analysis, parameter choices for observing trends are often made ad hoc in past studies. For examples, different year spans might be used to create the time sequence and different indices were chosen for trend observation. However, the effectiveness of these choices was hardly known, quantitatively and comparatively. This work provides clues to better interpret the results when a certain choice was made. Specifically, by sorting research topics in decreasing order of interest predicted by a trend index and then by evaluating this ordering based on information retrieval measures, we compare a number of trend indices (percentage of increase vs. regression slope), trend formulations (simple trend vs. eigen-trend), and options (various year spans and durations for prediction) in different domains (safety agriculture and information retrieval) with different collection scales (72500 papers vs. 853 papers) to know which one leads to better trend observation. Our results show that the slope of linear regression on the time series performs constantly better than the others. More interestingly, this index is robust under different conditions and is hardly affected even when the collection was split into arbitrary (e.g., only two) periods. Implications of these results are discussed. Our work does not only provide a method to evaluate trend prediction performance for scientometrics, but also provides insights and reflections for past and future trend observation studies.

Keywords: Scientometrics

? Sternitzke, C. (2009), Defining triadic patent families as a measure of technological strength. *Scientometrics*, **81** (1), 91-109.

Full Text: [2009\Scientometrics81, 91.pdf](2009/Scientometrics81,%2091.pdf)

Abstract: A frequently used indicator for assessing technological strengths of nations are patents registered in the triad region, i.e. in North America, Europe, and Asia. Currently these so-called triadic patents are defined as filed at the United States Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the Japanese Patent Office (JPO). Recent developments suggested that this definition might lack adequacy regarding the offices in Europe and Asia. Our findings propose that in particular Germany and China should be added to this triad definition since in some technology fields patents registered in these countries show the same citation impact as patents registered at the EPO or JPO. Our results also underline that the number of triadic patent families per country is a function of technological specialization and (national) patenting strategies.

Keywords: Statistics

? Zuccala, A. and van den Besselaar, P. (2009), Mapping review networks: Exploring research community roles and contributions. *Scientometrics*, **81** (1), 111-122.

Full Text: [2009\Scientometrics81, 111.pdf](2009/Scientometrics81,%20111.pdf)

Abstract: In this paper we investigate the position of a review network within a research specialty, the network of scholars who write reviews of their colleagues’ work. This is one of the voluntary activities that researchers perform as a prerequisite for the functioning of the invisible college. We compare this network to other networks within the specialty, and this allows us to distinguish various roles: stars, influentials, members, reviewers and juniors. As scholars are characterized by different role-configurations, the invisible college becomes stratified. We discuss the implications for the development of a referee factor and review factor, norms for refereeing and reviewing, and the development of systems-based research evaluations.

Keywords: Author Cocitation, Collaboration

? Kao, C. (2009), The authorship and internationality of Industrial Engineering journals. *Scientometrics*, **81** (1), 123-136.

Full Text: [2009\Scientometrics81, 123.pdf](2009/Scientometrics81,%20123.pdf)

Abstract: This paper surveys 32 renowned Industrial Engineering (IE) journals with regard to authorship for the period of 1996-2005. The findings show that the USA was the top contributing country, accounting for approximately one-third of the total number of articles. The 80/20 rule and the entropy measure consistently identify Issues in Science and Technology (IST), Industrial Engineer (IE), and R&D Magazine (RDM) as journals of high country concentration, or journals of low internationality. Conversely, Journal of Materials Processing Technology (JMPT), Production Planning & Control (PPC), and Technovation (TNV) have the highest degree of country diversity, or internationality. The quality of a journal, as expressed by impact factors, its internationality, and its number of articles published, are found to be independent of each other.

Keywords: Citation Patterns, Information-Science, Operational-Research, Rankings, Scientific Journals, Scientometrics

? Abramo, G., D’Angelo, C.A. and Capraseccaa, A. (2009), The contribution of star scientists to overall sex differences in research productivity. *Scientometrics*, **81** (1), 137-156.

Full Text: [2009\Scientometrics81, 137.pdf](2009/Scientometrics81,%20137.pdf)

Abstract: The state of the art on the issue of sex differences in research efficiency agrees in recognizing higher performances for males, however there are divergences in explaining the possible causes. One of the causes advanced is that there are sex differences in the availability of aptitude at the “high end”. By comparing sex differences in concentration and performance of Italian academic star scientists to the case in the population complement, this work aims to verify if star, or “high-end”, scientists play a preponderant role in determining higher performance among males. The study reveals the existence of a greater relative concentration of males among star scientists, as well as a performance gap between male and female star scientists that is greater than for the rest of the population. In the latter subpopulation the performance gap between the two sexes is seen as truly marginal.

Keywords: Ability, Gender-Differences, Impact, Meta-Analysis, Metaanalysis, Patterns, Publication Productivity

? Park, H.W. and Leydesdorff, L. (2009), Knowledge linkage structures in communication studies using citation analysis among communication journals. *Scientometrics*, **81** (1), 157-175.

Full Text: [2009\Scientometrics81, 157.pdf](2009/Scientometrics81,%20157.pdf)

Abstract: This research analyzes a “who cites whom” matrix in terms of aggregated journal-journal citations to determine the location of communication studies on the academic spectrum. Using the Journal of Communication as the seed journal, the 2006 data in the Journal Citation Reports are used to map communication studies. The results show that social and experimental psychology journals are the most frequently used sources of information in this field. In addition, several journals devoted to the use and effects of media and advertising are weakly integrated into the larger communication research community, whereas communication studies are dominated by American journals.

Keywords: Index, Internet, Korea, Science, Scientific Journals, Social Network Analysis

? Sooryamoorthy, R. (2009), Do types of collaboration change citation? Collaboration and citation patterns of South African science publications. *Scientometrics*, **81** (1), 177-193.

Full Text: [2009\Scientometrics81, 177.pdf](2009/Scientometrics81,%20177.pdf)

Abstract: Bibliographic records are extensively used in the study of citations. Based on ISI data, this paper examines citation patterns of the publications of South African scientists in recent years. In particular, the focus of this paper is on citations as to the collaborative dimensions of South African scientists in their publications. The study reveals that the number of citations received by a publication varies not only according to the collaboration but also to the types of collaboration of the authors who are involved in its production. Furthermore, it emerges that the impact of citations on publications differs from discipline to discipline, and affiliating sector to sector, regardless of collaboration.

Keywords: Areas, Impact, Indicators, International Collaboration, Nations, Output, Periphery, Scientific Productivity

? Schmoch, U. and Schubert, T. (2009), Sustainability of incentives for excellent research - The German case. *Scientometrics*, **81** (1), 195-218.

Full Text: [2009\Scientometrics81, 195.pdf](2009/Scientometrics81,%20195.pdf)

Abstract: The state authorities in Germany used to fund public sector research without controlling the performance of the research units. This has changed during past decade, where the dominant mechanism by which formerly unconditional state funds are allocated nowadays is indicator-based performance measurement. The indicator sets used to measure the research-related performance in the German public science sector are usually very narrow, often consisting exclusively of finished doctoral theses and third-party funds. Using a unique dataset of 473 German research units from astrophysics, nanotechnology, economics and biotechnology, this paper outlines principles for the construction of sensible indicator sets for the performance measurement of scientific research groups. It is argued that scientific production is multidimensional. Thus one-sided indicator sets that fail to cover the relevant output dimensions give rise to incentives that will ultimately lower the performance of the science sector in total. Indicator sets should strive for sustainable incentives, which can be guaranteed if the sets are broad enough. As a starting point it is shown that the very common performance indicator ‘acquired third-party funds’ may affect research efficiency negatively, especially if the level of third-party funds is already very high. Therefore, we conclude that third-party funds should be used with great care, if at all.

Keywords: Data Envelopment Analysis, Efficiency, Higher-Education, Impact, Indicator, Research Performance, Science, System, Universities

? Valkimadi, P.E., Karageorgopoulos, D.E., Vliagoftis, H. and Falagas, M.E. (2009), Increasing dominance of English in publications archived by PubMed. *Scientometrics*, **81** (1), 219-223.

Full Text: [2009\Scientometrics81, 219.pdf](2009/Scientometrics81,%20219.pdf)

Abstract: English is becoming the international language in numerous fields of human civilization. We sought to evaluate the extent of use of English in the field of biomedical publications. We searched in PubMed for the number of articles written in the 57 indexed languages, during each one of the four past 10-year periods. The extent of use of English as the publication language of articles included in PubMed has gradually risen from 62.3% of the total number of indexed articles between 1967-1976, to 74.0% between 1977-1986, 83.4% between 1987-1996, and reached 89.3% in the period between 1997-2006. The percentage of articles written in each one of the other languages was less than 1.6% for the period of 1997-2006. Apart from English, only the percentage of articles written in Chinese has risen between 1967-1976 and 1997-2006 (from 0.05% to 1.49%). In conclusion, the dominance of English in biomedical publications archived by the most commonly used database is impressive and increasing. This fact may have several consequences, favourable or not, in various aspects of scientific production.

Keywords: Fields, Impact Factor, Journals, Language, Science

? Guerrero-Bote, V.P., Gomez-Crisostomo, R., Romo-Fernandez, L.M. and de Moya-Anegon, F. (2009), Visibility and responsibility of women in research papers through the order of signatures: the case of the University of Extremadura, 1990-2005. *Scientometrics*, **81** (1), 225-238.

Full Text: [2009\Scientometrics81, 225.pdf](2009/Scientometrics81,%20225.pdf)

Abstract: Though there are many and diverse opinions as to the order in which the authors appear in research papers, the most accepted is the one which gives more responsibility to the first and last author. In this work, a study is carried out of the order in which the authors appear in research papers, in which at least one author affiliated to the University of Extremadura (Spain) has collaborated in the 1990-2005 period. The objective is to determine the difference in the position of men and women, and the resulting responsibility and visibility of female authors as opposed to male authors. In the University of Extremadura these positions are principally occupied by men, since throughout the period studied, no more than 20% of the papers have women either in the first or last position, while the percentage obtained by men is around 50%, the remaining percentage being occupied by authors not belonging at present to the Uex. Nevertheless, the women of the University of Extremadura have both a higher percentage than expected and a positive evolution in the more relevant positions in recent years.

Keywords: Authorship, Scientists

? Duque, R.B., Shrum, W.M., Barriga, O. and Henriquez, G. (2009), Internet practice and professional networks in Chilean science: Dependency or progress? *Scientometrics*, **81** (1), 239-263.

Full Text: [2009\Scientometrics81, 239.pdf](2009/Scientometrics81,%20239.pdf)

Abstract: The conventional view depicts scientific communities in the developing world as globally isolated and dependent. Recent studies suggest that individual scientists tend to favor either local or international ties. Yet there are good reasons to believe that both kinds of ties are beneficial for knowledge production. Since they allow for the more efficient management of social networks, Internet technologies are expected to resolve this inverse relationship. They are also expected to decentralize access to resources within developing regions that have traditionally reflected an urban male bias. Elaborating upon science, development and social network perspectives, we examine the impact of the Internet in the Chilean scientific community, addressing the questions ‘to what extent is Internet use and experience associated with the size of foreign and domestic professional networks?’ and ‘are professional network resources equitably distributed across regional and demographical dimensions?’ We offer results from a communication network survey of 337 Chilean researchers working in both academic departments and research institutes. We introduce a new measure, ‘collaboration range’, to indicate the extent to which scientists engage in work with geographically dispersed contacts. Results suggest that larger foreign networks are associated with higher email use and diversity, but local networks are smaller with longer use of the Internet. Diversity of email use is also associated with diverse geographical networks. Moreover, Internet use may be reducing the significance of international meetings for scientific collaboration and networking. Finally, results also show that in the Internet age professional network resources are distributed symmetrically throughout the Chilean scientific community.

Keywords: Collaboration, Computer-Networks, Electronic Networks, Engineering Faculty, Information, Latin-America, Scholarly Communication, Small Institutions, Social-Sciences, Weak Ties

? Pinto, M., Guerrero, D., Fernandez-Ramos, A. and Doucet, A.V. (2009), Information provided by Spanish university websites on their assessment and quality processes. *Scientometrics*, **81** (1), 265-289.

Full Text: [2009\Scientometrics81, 265.pdf](2009/Scientometrics81,%20265.pdf)

Abstract: We analyze and evaluate the information provided by Spanish public universities on the web about their assessment and quality processes with the aim of detecting aspects for improvement and identifying best practices in universities that could act as a benchmark for the rest of the sector. A tested model/template incorporating a set of criteria and indicators is used to determine the quality of this information. The strengths and weaknesses of institutional websites are analyzed at both individual level and as a whole, the possible relation between website quality and the characteristics of the universities is also examined.

Keywords: Criteria, Health Information, Internet, Web Sites

? Koczy, L.A. and Strobel, M. (2009), The invariant method can be manipulated. *Scientometrics*, **81** (1), 291-293.

Full Text: [2009\Scientometrics81, 291.pdf](2009/Scientometrics81,%20291.pdf)

Abstract: We show that the invariant method [Pinski & Narin, 1976], recently axiomatised by Palacios-Huerta & Volij [2004], and used to quality-rank academic journals is subject to manipulation: a journal can boost its performance by making additional citations to other journals.

? Ortega, J.L., Cothey, V. and Aguillo, I.F. (2009), How old is the Web? Characterizing the age and the currency of the European scientific Web. *Scientometrics*, **81** (1), 295-309.

Full Text: [2009\Scientometrics81, 295.pdf](2009/Scientometrics81,%20295.pdf)

Abstract: The aim of this paper is to model and study the age of the Web using a sample of about four million of web pages from the 16 European Research Area countries obtained during 2004 and 2005. Web page time-stamp (date when the web pages were created or last changed for last time), format and size in bytes data have been analysed. Several indicators are introduced to measure longitudinal aspects of the Web. Half-age is proposed as a measure of the age distribution because this is found to be exponential. “Web Update Index” and “Lifespan Index” are introduced to measure the changing rate of a small sample over time. Results show that the British Web space has the youngest Web pages while the Greek and Belgian ones have the oldest. The study also compared Web pages topics and found that Biology pages are more stable than Physics pages.

Keywords: Academic Web, Decay, Life, Links, Obsolescence, Page, Persistence, References

? Egghe, L. (2009), Comparative study of h-index sequences. *Scientometrics*, **81** (2), 311-320.

Full Text: [2009\Scientometrics81, 311.pdf](2009/Scientometrics81,%20311.pdf)

Abstract: This paper studies four different h-index sequences (different in publication periods and/or citation periods). Lotkaian models for these h-index sequences are presented by mutual comparison of one sequence with another one. We also give graphs of these h-sequences for this author on which a discussion is presented. The same is done for the g-index and the R-index.

Keywords: Hirsch-Index

? Hendrix, D. (2009), Institutional self-citation rates: A three year study of universities in the United States. *Scientometrics*, **81** (2), 321-331.

Full Text: [2009\Scientometrics81, 321.pdf](2009/Scientometrics81,%20321.pdf)

Abstract: Using Institute for Scientific Information (ISI) data, this paper calculated institutional self citations rates (ISCRs) for 96 of the top research universities in the United States from 2005-2007. Exhibiting similar temporal patterns of author and journal self-citations, the ISCR was 29% in the first year post-publication, and decreased significantly in the second year post-publication (19%). Modeling the data via power laws revealed total publications and citations did not correlate with the ISCR, but did correlate highly with ISCs. California Institute of Technology exhibited the highest ISCR at 31%. Academic and cultural factors are discussed in relation to ISCRs.

Keywords: Authors, h-Index, Indicators, Information-Science, Journal Impact Factors, Network

? Catling, J.C., Mason, V.L. and Upton, D. (2009), Quality is in the eye of the beholder? An evaluation of impact factors and perception of journal prestige in the UK. *Scientometrics*, **81** (2), 333-345.

Full Text: [2009\Scientometrics81, 333.pdf](2009/Scientometrics81,%20333.pdf)

Abstract: A number of proxy measures have been used as indicators of journal quality. The most recent and commonly employed are journal impact factors. These measures are somewhat controversial, although they are frequently referred to in establishing the impact of published journal articles. Within psychology, little is known about the relationship between the ‘objective’ impact factors of journals and the ‘subjective’ ratings of prestige and perceived publishing difficulty amongst academics. In order to address this, a cross-sectional web-based survey was conducted in the UK to investigate research activity and academics’ views of journals within three fields of psychology, cognitive, health and social. Impact factors for each journal were correlated with individual academic’s perceptions of prestige and publishing difficulty for each journal. A number of variables pertaining to the individual academic and their place of work were assessed as predictors of these correlation values, including age, gender, institution type, and a measure of departmental research activity. The implications of these findings are discussed in relation to perceptions of journal prestige and publishing difficulty, higher education in general and the assessment of research activity within academic institutions.

Keywords: Citation Impact

? Ardanuy, J., Urbano, C. and Quintana, L. (2009), A citation analysis of Catalan literary studies (1974-2003): Towards a bibliometrics of humanities studies in minority languages. *Scientometrics*, **81** (2), 347-366.

Full Text: [2009\Scientometrics81, 347.pdf](2009/Scientometrics81,%20347.pdf)

Abstract: A citation analysis was carried out on the most important research journals in the field of Catalan literature between 1974 and 2003. The indicators and qualitative parameters obtained show the value of performing citation analysis in cultural and linguistic areas that are poorly covered by the A&HCI. Catalan literature shows a similar pattern to that of humanities in general, but it could still be in a stage of consolidation because too little work has as yet been published.

Keywords: Arts-And-Humanities, Author Self-Citations, English, Fine-Arts, Information Needs, Monographs, Patterns, Philosophy, Scholarship, Science

? Yegros, A.Y. and Amat, C.B. (2009), Editorial delay of food research papers is influenced by authors’ experience but not by country of origin of the manuscripts. *Scientometrics*, **81** (2), 367-380.

Full Text: [2009\Scientometrics81, 367.pdf](2009/Scientometrics81,%20367.pdf)

Abstract: Editorial delay, the time between submission and acceptance of scientific manuscripts, was investigated for a set of 4,540 papers published in 13 leading food research journals. Groups of accelerated papers were defined as those that fell in the lower quartile of the distribution of the editorial delay for the journals investigated. Delayed papers are those in the upper quartile of the distribution. Editorial stage is related to the peer review process and two variables were investigated in search of any bias in editorial review that could influence publication delay: countries of origin of the manuscript and authors’ previous publishing experience in the same journal. A ranking of countries was established based on contributions to the leading food research journals in the period 1999-2004 and four categories comprising heavy, medium, light and occasional country producers was established. Chi square tests show significant differences in country provenance of manuscripts only for one journal. The results for influence on editorial delay of cross-national research and international collaboration, conducted by means of the Fisher statistic test, were similar. A two-tailed Student’s t test shows significant differences (p < 0.05) in the distribution of experienced and novel authors across the delayed and accelerated groups of papers. Although these results are time and discipline limited, it can be concluded that authors’ publishing experience causes a faster review and acceptance of their papers and that neither country of provenance nor cross-national research influence the time involved in editorial acceptance of the papers.

Keywords: Acceptance, Assessments, Impact, Journals, Publication Bias, Stands Today, Statistical Significance, Submissions, Time, Trials

? Ball, R., Mittermaier, B. and Tunger, D. (2009), Creation of journal-based publication profiles of scientific institutions - A methodology for the interdisciplinary comparison of scientific research based on the J-factor. *Scientometrics*, **81** (2), 381-392.

Full Text: [2009\Scientometrics81, 381.pdf](2009/Scientometrics81,%20381.pdf)

Abstract: A form of normalisation is presented for the evaluation of citation data on multidisciplinary research. This method is based on the existing classification according to the publishing journals and not on the classification of output according to ISI subject categories. A publication profile is created for each institution to be investigated. This profile accounts for the weight of publications in a journal, represented by the number of publications as a proportion of the total output of the institution. In accordance with this weight, the citation rate of each journal is compared to a qualified relative indicator. The final result is a relative citation rate J, which is the relative perception of the performance of an institution accounting for its publication and citation habits and makes a transdisciplinary comparison possible.

Keywords: Impact, Indicators, Output

? Sombatsompop, N., Markpin, T., Wimolmala, E., Ratchatahirun, P., Premkamolnetr, N., Boonradsamee, B. and Yochai, W. (2009), Relationship on research publications and productivity-export volumes for natural rubber. *Scientometrics*, **81** (2), 393-405.

Full Text: [2009\Scientometrics81, 393.pdf](2009/Scientometrics81,%20393.pdf)

Abstract: This article investigated contributions of natural rubber (NR) research through research articles and patents in Science Citation Index Expanded (SCI-Expanded) and SCOPUS databases and related the results with productivity-export volumes during 2002-2006. 1,771 research papers and 5,686 patents on “natural rubber” were retrieved from the databases. The results revealed that the top five countries produced the NR raw material by the order of productivity volumes were Thailand, Indonesia, Malaysia, Vietnam and China whereas those produced the synthetic rubber were the United States, China, Japan, Russia and Germany. Among the top three countries for NR production, Malaysia became a NR producer for its own use, whereas Thailand and Indonesia still had higher export volumes. Research articles and patents on natural rubber had contribution shares of about 20.9% and 47.5% of all rubber publications, respectively. The patents on natural rubber were found to increase with time while the research articles remained unchanged. Journal of Applied Polymer Science was the most preferable for publishing the research papers on rubbers. Eight countries ranked in the top countries for contributing the research articles on natural rubber were the United States, India, Malaysia, France, Germany, Thailand, Japan and China, similar country distributions being also found for research articles on synthetic styrene-butadiene rubber except for Thailand and Malaysia. No linear relationship between the productivity-export volume and research publication number was observed, but the results implied that the growth rate for commercializing the rubber was greater than that for research and development of natural rubber. Most NR research works focused on neat NR, which was contributed the most by USA while NR blend and NR composite papers were mainly published by Indian researchers.

? Bornmann, L., Mutz, R. and Daniel, H.D. (2009), The influence of the applicants’ gender on the modeling of a peer review process by using latent Markov models. *Scientometrics*, **81** (2), 407-411.

Full Text: [2009\Scientometrics81, 407.pdf](2009/Scientometrics81,%20407.pdf)

Abstract: In the grant peer review process we can distinguish various evaluation stages in which assessors judge applications on a rating scale. Bornmann & al. [2008] show that latent Markov models offer a fundamentally good opportunity to model statistically peer review processes. The main objective of this short communication is to test the influence of the applicants’ gender on the modeling of a peer review process by using latent Markov models. We found differences in transition probabilities from one stage to the other for applications for a doctoral fellowship submitted by male and female applicants.

Keywords: Committee, Reliability, Selection, Validity

? Boshoff, N. (2009), Neo-colonialism and research collaboration in Central Africa. *Scientometrics*, **81** (2), 413-434.

Full Text: [2009\Scientometrics81, 413.pdf](2009/Scientometrics81,%20413.pdf)

Abstract: The study examines aspects of both neo-colonial ties and neo-colonial science in research papers produced by Central African countries. The primary focus is on the extent and pattern of neo-colonial ties and other foreign participation in the co-authorship of Central African research papers. The analysis revealed that 80% of Central Africa’s research papers are produced in collaboration with a partner from outside the region. Moreover, 46% of papers are produced in collaboration with European countries as the only partner, and 35% in collaboration with past colonial rulers. The top collaborating countries are France (32%), the USA (14%), and the UK and Germany (both 12%). Foreign powers also facilitate the production of regionally and continentally co-authored papers in Central Africa, where European countries participate in 77% of regionally co-authored papers. The practice of neo-colonial science, on the other hand, features in a survey of reprint authors of Cameroonian papers. The survey investigated specific contributions made by Cameroon coauthors to the research processes underlying a paper. Cameroonian researchers contribute intellectually and conceptually to the production of research papers, irrespective of whether the collaboration involves partners from past colonial or non-colonial countries. Their most frequent role in collaborative research with foreign researchers remains the conduct of fieldwork.

Keywords: Developing-Countries, Globalization, Periphery, Science, World

? Gomez-Sancho, J.M. and Mancebon-Torrubia, M.J. (2009), The evaluation of scientific production: Towards a neutral impact factor. *Scientometrics*, **81** (2), 435-458.

Full Text: [2009\Scientometrics81, 435.pdf](2009/Scientometrics81,%20435.pdf)

Abstract: Measurement of research activity still remains a controversial question. The use of the impact factor from the Institute for Scientific Information (ISI) is quite widespread nowadays to carry out evaluations of all kinds, however, the calculation formula employed by ISI in order to construct its impact factors biases the results in favour of knowledge fields which are better represented in the sample, cite more in average and whose citations are concentrated in the early years of the articles. In the present work, we put forward a theoretical proposal regarding how aggregated normalization should be carried out with these biases, which allows comparing scientific production between fields, institutions and/or authors in a neutral manner. The technical complexity of such work, together with data limitations, lead us to propose some adjustments on the impact factor proposed by ISI which - although they do not completely solve the problem - reduce it and allow glimpsing the path towards more neutral evaluations. The proposal is empirically applied to three analysis levels: single journals, knowledge fields and the set of journals from the Journal Citation Report.

Keywords: Accuracy, Citation Analysis, Databases, Indicators, Informetrics, Journal Impact, Language, Performance, Publications, Quality

? Chen, C.F., Sun, K., Wu, G., Tang, Q., Qin, J., Chiu, K., Fu, Y.S., Wang, X.F. and Liu, J. (2009), The impact of internet resources on scholarly communication: A citation analysis. *Scientometrics*, **81** (2), 459-474.

Full Text: [2009\Scientometrics81, 459.pdf](2009/Scientometrics81,%20459.pdf)

Abstract: The quality and credibility of Internet resources has been a concern in scholarly communication. This paper reports a quantitative analysis of the use of Internet resources in journal articles and addresses the concerns for the use of Internet resources scholarly journals articles. We collected the references listed in 35,698 articles from 14 journals published during 1996 to 2005, which resulted in 1,000,724 citations. The citation data was divided into two groups: traditional citations and Web citations, and examined based on frequencies of occurrences by domain and type of Web citation sources. The findings included: (1) The number of Web citations in the journals investigated had been increasing steadily, though the quantity was too small to draw an inclusive conclusion on the data about their impact on scientific research, (2) A great disparity existed among different disciplines in terms of using information on the Web. Applied disciplines and interdisciplinary sciences tended to cite more information on the Web, while classical and experimental disciplines cited little of Web information, (3) The frequency of citations was related to the reputation of the author or the institution issuing the information, and not to the domain or webpage types, and (4) The researchers seemed to lack confidence in Internet resources, and Web information was not as frequently cited as reported in some publications before. The paper also discusses the need for developing a guideline system to evaluate Web resources regarding their authority and quality that lies in the core of credibility of Web information.

Keywords: Behavior, Electronic Resources, Journals, Web

? Hu, X.J. and Rousseau, R. (2009), A comparative study of the difference in research performance in biomedical fields among selected Western and Asian countries. *Scientometrics*, **81** (2), 475-491.

Full Text: [2009\Scientometrics81, 475.pdf](2009/Scientometrics81,%20475.pdf)

Abstract: In this study, a series of relative indicators are used to compare the difference in research performance in biomedical fields between ten selected Western and Asian countries. Based on Thomson’s Essential Science Indicators (ESI) 1996-2006, the output of papers and their citations in ten biomedical fields are compared at multiple levels using relative indicators. Chart diagrams and hierarchical clustering are applied to represent the data. The results confirm that there are many differences in intra- and interdisciplinary scientific activities between the West and the East. In most biomedical fields Asian countries perform below world average.

Keywords: China, EU, Europe, Impact, Indicators, Innovation, Output, Science, Technology, World

? Ye, F.Y. (2009), An investigation on mathematical models of the h-index. *Scientometrics*, **81** (2), 493-498.

Full Text: [2009\Scientometrics81, 493.pdf](2009/Scientometrics81,%20493.pdf)

Abstract: Based on two large data samples from ISI databases, the author evaluated the Hirsch model, the Egghe-Rousseau model, and the Glänzel-Schubert model of the h-index. The results support the Glänzel-Schubert model as a better estimation of the h-index at both journal and institution levels. If h (c), h (p) and h (pc) stand for the Hirsch estimation, Egghe-Rousseau estimation, and Glänzel-Schubert estimation, respectively, then an inequality h (p) < h similar to h (pc) < h (c) holds in most cases.

Keywords: Hirsch-Index

? Lu, H.Q. and Feng, Y.Q. (2009), A measure of authors’ centrality in co-authorship networks based on the distribution of collaborative relationships. *Scientometrics*, **81** (2), 499-511.

Full Text: [2009\Scientometrics81, 499.pdf](2009/Scientometrics81,%20499.pdf)

Abstract: Although there are many measures of centrality of individuals in social networks, and those centrality measures can be applied to the analysis of authors’ importance in co-authorship networks, the distribution of an author’s collaborative relationships among different communities has not been considered. This distribution or extensity is an important aspect of authors’ activity. In the present study, we will propose a new measure termed extensity centrality, taking into account the distribution of an author’s collaborative relationships. In computing the strength of collaborative ties, which is closely related to the extensity centrality, we choose Salton’s measure. We choose the ACM SIGKDD data as our testing data set, and analyze the result of authors’ importance from different points of view.

? Barcza, K. and Telcs, A. (2009), Paretian publication patterns imply Paretian Hirsch index. *Scientometrics*, **81** (2), 513-519.

Full Text: [2009\Scientometrics81, 513.pdf](2009/Scientometrics81,%20513.pdf)

Abstract: The paper pursues the rigorous mathematical study of the Hirsch index and shows that it has power law upper tail distribution and determines the exponent provided that the underlying publication and citation distributions have fat tails as well. The result is demonstrated on the distribution of the Hirsch index of journals. The paper is concluded with some further remarks on the Hirsch index.

Keywords: h-Index, Journals

? Wohlin, C. (2009), A new index for the citation curve of researchers. *Scientometrics*, **81** (2), 521-533.

Full Text: [2009\Scientometrics81, 521.pdf](2009/Scientometrics81,%20521.pdf)

Abstract: Internet has made it possible to move towards researcher and article impact instead of solely focusing on journal impact. To support citation measurement, several indexes have been proposed, including the h-index. The h-index provides a point estimate. To address this, a new index is proposed that takes the citation curve of a researcher into account. This article introduces the index, illustrates its use and compares it to rankings based on the h-index as well as rankings based on publications. It is concluded that the new index provides an added value, since it balances citations and publications through the citation curve.

Keywords: Institutions, Scholars

? Wainer, J., Xavier, E.C. and Bezerra, F. (2009), Scientific production in Computer Science: A comparative study of Brazil and other countries. *Scientometrics*, **81** (2), 535-547.

Full Text: [2009\Scientometrics81, 535.pdf](2009/Scientometrics81,%20535.pdf)

Abstract: In this paper we present a study about scientific production in Computer Science in Brazil and several other countries, as measured by the number of articles in journals and conference proceedings indexed by ISI and by Scopus. We compare the Brazilian production from 2001 to 2005 with some Latin American, Latin European, BRIC (Brazil, Russia, India, China), and other relevant countries (South Korea, Australia and USA). We also classify and compare these countries according to the ratio of publications in journals and conferences (the ones indexed by the two services). The results show that Brazil has by far the largest production among Latin American countries, has a production about one third of Spain’s, one fourth of Italy’s, and about the same as India and Russia. The growth in Brazilian publications during the period places the country in the mid-range group and the distribution of Brazilian production according to impact factor is similar to most countries.

Keywords: Articles, Journals, Publications

? Campanario, J.M. (2009), Rejecting and resisting Nobel class discoveries: Accounts by Nobel Laureates. *Scientometrics*, **81** (2), 549-565.

Full Text: [2009\Scientometrics81, 549.pdf](2009/Scientometrics81,%20549.pdf)

Abstract: I review and discuss instances in which 19 future Nobel Laureates encountered resistance on the part of the scientific community towards their discoveries, and instances in which 24 future Nobel Laureates encountered resistance on the part of scientific journal editors or referees to manuscripts that dealt with discoveries that later would earn them the Nobel Prize.

Keywords: Articles, Delayed Recognition, Physics, Referees, Reflections, Resistance, Scientific Discovery

? Egghe, L. (2009), Performance and its relation with productivity in Lotkaian systems. *Scientometrics*, **81** (2), 567-585.

Full Text: [2009\Scientometrics81, 567.pdf](2009/Scientometrics81,%20567.pdf)

Abstract: In general information production processes (IPPs), we define productivity as the total number of sources but we present a choice of seven possible definitions of performance: the mean or median number of items per source, the fraction of sources with a certain minimum number of items, the h-, g-, R- and h(w)-index. We give an overview of the literature on different types of IPPs and each time we interpret “performance” in these concrete cases. Examples are found in informetrics (including webometrics and scientometrics), linguistics, econometrics and demography. In Lotkaian IPPs we study these interpretations of “performance” in function of the productivity in these IPPs. We show that the mean and median number of items per source as well as the fraction of sources with a certain minimum number of items are increasing functions of the productivity if and only if the Lotkaian exponent is decreasing in function of the productivity. We show that this property implies that the g-, R- and h(w)-indices are increasing functions of the productivity and, finally, we show that this property implies that the h-index is an increasing function of productivity. We conclude that the h-index is the indicator which shows best the increasing relation between productivity and performance.

Keywords: Authorship, Collaboration, Hirsch-Index, Internet, Random Networks, Scientific-Research Output, Successive h-Indexes, Topology, World-Wide-Web, Zipfs Law

? Vieira, E.S. and Gomes, J.A.N.F. (2009), A comparison of Scopus and Web of Science for a typical university. *Scientometrics*, **81** (2), 587-600.

Full Text: [2009\Scientometrics81, 587.pdf](2009/Scientometrics81,%20587.pdf)

Abstract: For many years, the ISI Web of Knowledge from Thomson Reuters was the sole publication and citation database covering all areas of science thus becoming an invaluable tool in bibliometric analysis. In 2004, Elsevier introduced Scopus and this is rapidly becoming a good alternative. Several attempts have been made at comparing these two instruments from the point of view of journal coverage for research or for bibliometric assessment of research output. This paper attempts to answer the question that all researchers ask, i.e., what is to be gained by searching both databases? Or, if you are forced to opt for one of them, which should you prefer? To answer this question, a detailed paper by paper study is presented of the coverage achieved by ISI Web of Science and by Scopus of the output of a typical university. After considering the set of Portuguese universities, the detailed analysis is made for two of them for 2006, the two being chosen for their comprehensiveness typical of most European universities. The general conclusion is that about 2/3 of the documents referenced in any of the two databases may be found in both databases while a fringe of 1/3 are only referenced in one or the other. The citation impact of the documents in the core present in both databases is higher, but the impact of the fringe that are present only in one of the databases should not be disregarded as some high impact documents may be found among them.

Keywords: Citation, Databases, Google-Scholar, h-Index, Of-Science

? Qiu, H. and Chen, Y.F. (2009), Bibliometric analysis of biological invasions research during the period of 1991 to 2007. *Scientometrics*, **81** (3), 601-610.

Full Text: [2009\Scientometrics81, 601.pdf](2009/Scientometrics81,%20601.pdf)

Abstract: The objective of this study is to conduct a bibliometric analysis of all biological invasions-related publications in the Science Citation Index (SCI) from 1991 to 2007. The indicator citation per publication (CPP) was used to evaluate the impact of articles, journals, and institutions. In the 3323 articles published in 521 journals, 7261 authors from 1905 institutions of 100 countries participated. As the most productive country of biological invasions research, the US will benefit from more collaboration between institutions, countries, and continents. In addition, analysis of keywords was applied to reveal research trends.

Keywords: Bibliometric Analysis, Ecology, Impact, Publications, Research, SCI, Science Citation Index

? Calver, M.C. and Bradley, J.S. (2009), Should we use the mean citations per paper to summarise a journal’s impact or to rank journals in the same field? *Scientometrics*, **81** (3), 611-615.

Full Text: [2009\Scientometrics81, 611.pdf](2009/Scientometrics81,%20611.pdf)

Abstract: The mean citations per paper is used increasingly as a simple metric for indicating the impact of a journal or comparing journal rankings. While convenient, we suggest that it has limitations given the highly skewed distributions of citations per paper in a wide range of journals.

Keywords: Citations, Impact, Rankings

? Gagolewski, M. and Grzegorzewski, P. (2009), A geometric approach to the construction of scientific impact indices. *Scientometrics*, **81** (3), 617-634.

Full Text: [2009\Scientometrics81, 617.pdf](2009/Scientometrics81,%20617.pdf)

Abstract: Two broad classes of scientific impact indices are proposed and their properties - both theoretical and practical - are discussed. These new classes were obtained as a geometric generalization of the well-known tools applied in scientometric, like Hirsch’s h-index, Woeginger’s w-index and the Kosmulski’s Maxprod. It is shown how to apply the suggested indices for estimation of the shape of the citation function or the total number of citations of an individual. Additionally, a new efficient and simple O(log n) algorithm for computing the h-index is given.

Keywords: Citations, h Index, h-Index, Hirsch-Index, Impact, Ranking, Researchers

? Panaretos, J. and Malesios, C. (2009), Assessing scientific research performance and impact with single indices. *Scientometrics*, **81** (3), 635-670.

Full Text: [2009\Scientometrics81, 635.pdf](2009/Scientometrics81,%20635.pdf)

Abstract: We provide a comprehensive and critical review of the h-index and its most important modifications proposed in the literature, as well as of other similar indicators measuring research output and impact. Extensions of some of these indices are presented and illustrated.

Keywords: Bibliometric Indicators, Citation Analysis, h Index, Hirsch-Type Indexes, Impact, Journals, Model, Publications, Ranking, Research, Research Output, Science, Successive H-Indexes

? Zou, F., Wu, M.X. and Wu, K.L. (2009), Outcomes associated with ophthalmology, optometry and visual science literature in the Science Citation Index from mainland China, 2000-2007. *Scientometrics*, **81** (3), 671-682.

Full Text: [2009\Scientometrics81, 671.pdf](2009/Scientometrics81,%20671.pdf)

Abstract: Bibliographic data on ophthalmology, optometry and visual science (OOVS) literature of China drawn from the SCI-Expanded database covering the period 2000-2007 (961 publications) were analyzed to create a comprehensive overview of research output. Of 961 articles, 480 were published in 2006 and 2007. The majority of researchers worked in university hospitals (53%). 21% of the publications included one or more international co-authors. For each article, the average author number was 4.96 +/- 2.73, which increased from 3.96 in 2000 to 5.36 in 2007. The most cited references came from Investigative Ophthalmology & Visual Science and Ophthalmology. The greatest number of studies was focused on the retina.

Keywords: Authorship, Bibliometric Analysis, China, Fields, Medical Journals, Publications, Research, Research Output, Research Productivity, Science Citation Index, Vision Science

? Guan, J.C. and Ma, N. (2009), Structural equation model with PLS path modeling for an integrated system of publicly funded basic research. *Scientometrics*, **81** (3), 683-698.

Full Text: [2009\Scientometrics81, 683.pdf](2009/Scientometrics81,%20683.pdf)

Abstract: This study develops and tests an integrated conceptual model of basic research evaluation from a varying perspective. The main objective is to obtain a more complete understanding of the external factors affecting the publicly fund basic research in a country. Structural Equation Modeling (SEM) with Partial Least Squares (PLS) is used to test the conceptual model with empirical data collected from WCY (World Competitiveness Yearbook) and ESI (Essential Science Indicators) database. Interrelationships among the research output and outcome, together with three external factors (resource, impetus, accumulative advantage) have been successfully explored and the conceptual model of journal evaluation has been examined.

Keywords: Academic Research, Cumulative Advantage, Departments, Essential Science Indicators, Evaluation, Indicators, Industrial-Innovation, Knowledge, Modeling, Paradigm, Productivity Growth, Research, Research Output, Research-and-Development, Science, SEM

? Mojzes, I. and Farkas, Z.B. (2009), The speed of dissemination of information about the realization of the fourth passive electronic circuit element measured by Google hits. *Scientometrics*, **81** (3), 699-702.

Full Text: [2009\Scientometrics81, 699.pdf](2009/Scientometrics81,%20699.pdf)

Abstract: This paper aims to demonstrate briefly that major scientific achievements spread through the Internet according to an exponential expression until a saturation point.

Keywords: Memristor

? Hung, W.C., Lee, L.C. and Tsai, M.H. (2009), An international comparison of relative contributions to academic productivity. *Scientometrics*, **81** (3), 703-718.

Full Text: [2009\Scientometrics81, 703.pdf](2009/Scientometrics81,%20703.pdf)

Abstract: This paper presents a methodology for measuring the improvements in efficiency and adjustments in the scale of R&D (Research & Development) activities. For this purpose, this study decomposes academic productivity growth into components attributable to (1) world academic frontier change, (2) R&D efficiency change, (3) human capital accumulation, and (4) capital accumulation. The world academic frontier at each point in time is constructed using data envelopment analysis (DEA). This study calculates each of the above four components of academic productivity for 27 countries over 1990-2003, and finds that the components which contribute to academic productivity growth vary with the different countries’ characteristics and development stages. Human capital has more weight in terms of the quantity of academic research, and capital accumulation plays a more important role in the citation impact of academic research.

Keywords: Cross-Country, Data Envelopment Analysis, Efficiency Analysis, Growth, Impact, Indicators, Investment, Nations, R&D, Research, Research-and-Development, Scientific Wealth, Universities

? Porter, A.L. and Rafols, I. (2009), Is science becoming more interdisciplinary? Measuring and mapping six research fields over time. *Scientometrics*, **81** (3), 719-745.

Full Text: [2009\Scientometrics81, 719.pdf](2009/Scientometrics81,%20719.pdf)

Abstract: In the last two decades there have been studies claiming that science is becoming ever more interdisciplinary. However, the evidence has been anecdotal or partial. Here we investigate how the degree of interdisciplinarity has changed between 1975 and 2005 over six research domains. To do so, we compute well-established bibliometric indicators alongside a new index of interdisciplinarity (Integration score, aka Rao-Stirling diversity) and a science mapping visualization method. The results attest to notable changes in research practices over this 30 year period, namely major increases in number of cited disciplines and references per article (both show about 50% growth), and co-authors per article (about 75% growth). However, the new index of interdisciplinarity only shows a modest increase (mostly around 5% growth). Science maps hint that this is because the distribution of citations of an article remains mainly within neighboring disciplinary areas. These findings suggest that science is indeed becoming more interdisciplinary, but in small steps - drawing mainly from neighboring fields and only modestly increasing the connections to distant cognitive areas. The combination of metrics and overlay science maps provides general benchmarks for future studies of interdisciplinary research characteristics.

Keywords: Bibliometric Indicators, Bionanotechnology, Citations, Cocitation, Diversity, Mapping, Research, Strategies

? von Elm, E., Wandel, S. and Juni, P. (2009), The role of correspondence sections in post-publication peer review: A bibliometric study of general and internal medicine journals. *Scientometrics*, **81** (3), 747-755.

Full Text: [2009\Scientometrics81, 747.pdf](2009/Scientometrics81,%20747.pdf)

Abstract: Scientific journals claim that correspondence sections are for post-publication peer review. We compared the conditions for submission and the bibliometrics of letters-to-editors published in leading medical journals in 2002 and 2007 using journal-derived information and data from PubMed and Journal Citation Reports. The median time limit for letter submissions decreased from 6 to 3.5 weeks, the median word limit from 400 to 350. The median number of letters per published article was near one in both years. Only about half of the letters were followed by an author reply in either year. Electronic response systems were available for four journals in 2007.

Keywords: Audit, Bibliometric Study, Bibliometrics, Correspondence Columns, Impact Factor, Old Letters, Rules

? Wray, K.B. (2009), Did professionalization afford better opportunities for young scientists? *Scientometrics*, **81** (3), 757-764.

Full Text: [2009\Scientometrics81, 757.pdf](2009/Scientometrics81,%20757.pdf)

Abstract: I examine whether the professionalization of science, a process that unfolded between 1600 and 1899, afforded better opportunities for young scientists to make significant discoveries. My analysis suggests that the professionalization of the sciences did make it a little easier for scientists to make significant contributions at a younger age. But, I also argue that it is easy to exaggerate the effects of professionalization. Older and middle age scientists continued to play an important role in making significant discoveries throughout the history of modern science.

Keywords: Acceptance, Age, Productivity, Science

? Sierra-Flores, M.M., Guzman, M.V., Raga, A.C. and Perez, I. (2009), The productivity of Mexican astronomers in the field of outflows from young stars. *Scientometrics*, **81** (3), 765-777.

Full Text: [2009\Scientometrics81, 765.pdf](2009/Scientometrics81,%20765.pdf)

Abstract: We carry out a bibliometric study of the activity of astronomers in the field of Herbig-Haro (HH) objects. Through an appropriate choice of keywords, we recover the papers on HH objects from the ADS (Astrophysics Data Service) and ISI (“Web of Knowledge”) databases. From the two databases we recover number of papers and citations which differ by similar to 10%. We analyze an 11-year period, restricting ourselves to authors with at least 10 papers within the period. We analyze the number of papers and citations, as well as the H index of this set of authors. Within this sample, we identify the authors belonging to Mexican institutions. We find that the Mexican researchers perform very well, having higher publication and citation rates than the ones of the full sample of authors active in the field of HH objects. The Mexicans have a degree of specialization (measured as ratios between the production in the chosen field and the total production of the individual authors) similar to the one of the full sample. They collaborate in somewhat larger groups than the authors of the full sample. Finally, we have carried out a study of the impact in the chosen field of different astronomical journals. We find that the Revista Mexicana de Astronomia y Astrofisica is well placed in the “second tier” of astronomical publications.

Keywords: Bibliometric Study, Citations, Impact, ISI, Publications

? Garcia-Perez, M.A. (2009), A multidimensional extension to Hirsch’s h-index. *Scientometrics*, **81** (3), 779-785.

Full Text: [2009\Scientometrics81, 779.pdf](2009/Scientometrics81,%20779.pdf)

Abstract: The h-index is becoming a reference tool for career assessment and it is starting to be considered by some agencies and institutions in promotion, allocation, and funding decisions. In areas where h indices tend to be low, individuals with different research accomplishments may end up with the same h. This paper proposes a multidimensional extension of the h index in which the conventional h is only the first component. Additional components of the multidimensional index are obtained by computing the h-index for the subset of papers not considered in the immediately preceding component. Computation of the multidimensional index for 204 faculty members in Departments of Methodology of the Behavioral Sciences in Spain shows that individuals with the same h can indeed be distinguished by their values in the remaining components, and that the strength of the correlation of the second and third components of the multidimensional index with alternative bibliometric indicators is similar to that of the first component (i.e., the original h).

Keywords: Assessment, Bibliometric Indicators, Citation, h Index, Indicators, Output, Research, Scientific-Research, Spain

? Hartley, J. (2009), On the need to distinguish between author and journal self-citations. *Scientometrics*, **81** (3), 787-788.

Full Text: Scientometrics81, 787.pdf

Keywords: Self-Citations

? Reinhart, M. (2009), Peer review of grant applications in biology and medicine. Reliability, fairness, and validity. *Scientometrics*, **81** (3), 789-809.

Full Text: [2009\Scientometrics81, 789.pdf](2009/Scientometrics81,%20789.pdf)

Abstract: This paper examines the peer review procedure of a national science funding organization (Swiss National Science Foundation) by means of the three most frequently studied criteria reliability, fairness, and validity. The analyzed data consists of 496 applications for project-based funding from biology and medicine from the year 1998. Overall reliability is found to be fair with an intraclass correlation coefficient of 0.41 with sizeable differences between biology (0.45) and medicine (0.20). Multiple logistic regression models reveal only scientific performance indicators as significant predictors of the funding decision while all potential sources of bias (gender, age, nationality, and academic status of the applicant, requested amount of funding, and institutional surrounding) are non-significant predictors. Bibliometric analysis provides evidence that the decisions of a public funding organization for basic project-based research are in line with the future publication success of applicants. The paper also argues for an expansion of approaches and methodologies in peer review research by increasingly focusing on process rather than outcome and by including a more diverse set of methods e.g. content analysis. Such an expansion will be necessary to advance peer review research beyond the abundantly treated questions of reliability, fairness, and validity.

Keywords: Bibliometric Analysis, Foundation, Manuscript, National Science, Originality, Predictive-Validity, Quality, Research, Sciences, Scientific Performance

? Park, H.W. and Kang, J. (2009), Patterns of scientific and technological knowledge flows based on scientific papers and patents. *Scientometrics*, **81** (3), 811-820.

Full Text: [2009\Scientometrics81, 811.pdf](2009/Scientometrics81,%20811.pdf)

Abstract: This paper examines how Korean technological development is linked with scientific activities and spreads to industrial fields through knowledge flows. It empirically assesses the linkages between scientific and technological knowledge flows and technological innovation by determining whether the quantity and quality of scientific papers cited by, and the knowledge being absorbed in, Korean patents filed in USPTO varied over time, and between technology fields. We conducted MANOVA and then canonical discriminate analysis. Our findings are: the patterns of both the absorption of scientific knowledge and the diffusion of technological knowledge differ by period and by field, and the speed of knowledge diffusion differs by technology field. This implies that the time required for Korean investment in basic and applied research to impact her industrial innovation differs by technology field.

Keywords: Absorption, Citations, Diffusion, Impact, Industrial Innovation, Linkage, Research, Science, Uspto

? Zhang, L., Glänzel, W. and Liang, L.M. (2009), Tracing the role of individual journals in a cross-citation network based on different indicators. *Scientometrics*, **81** (3), 821-838.

Full Text: [2009\Scientometrics81, 821.pdf](2009/Scientometrics81,%20821.pdf)

Abstract: This study aims at detecting the role of individual journals and uncovering structural patterns of information flow among scientific journals in a cross-citation network, using different bibliometric indicators and statistical methods of data analysis. Beyond measuring the individual journals’ position within the communication network, we shed light on their cognitive background as well. Language barrier and lacking internationality proved one of the main hindrances for integration into the communication network. Moreover, some document types hinder journals from establishing self-links. Against our expectations, we have found a clear divergence between strongly interlinked and high-entropy journals. Furthermore, the analysis of strong links among different fields allows the detection of high-interdisciplinary journals.

Keywords: Bibliometric Indicators, Generalized Waring Distribution, Scientific Journals

? Zhou, P., Thijs, B. and Glänzel, W. (2009), Regional analysis on Chinese scientific output. *Scientometrics*, **81** (3), 839-857.

Full Text: [2009\Scientometrics81, 839.pdf](2009/Scientometrics81,%20839.pdf)

Abstract: Based on data from the Science Citation Index Expanded (SCIE) and using scientometric methods, we conducted a systematic analysis of Chinese regional contributions and international collaboration in terms of scientific publications, publication activity, and citation impact. We found that regional contributions are highly skewed. The top positions measured by number of publications or citations, share of publications or citations are taken by almost the same set of regions. But this is not the case when indicators for relative citation impact are used. Comparison between regional scientific output and R&D expenditure shows that Spearman’s rank correlation coefficient between the two indicators is rather low among the leading publication regions.

Keywords: Citations, Impact, Indicators, Publications, R&D, Research Performance, Science Citation Index, Science Fields

? Campanario, J.M. and Molina, A. (2009), Surviving bad times: The role of citations, self-citations and numbers of citable items in recovery of the journal impact factor after at least four years of continuous decreases. *Scientometrics*, **81** (3), 859-864.

Full Text: [2009\Scientometrics81, 859.pdf](2009/Scientometrics81,%20859.pdf)

Abstract: We studied the influence of the number of citations, the number of citable items and the number of journal self-citations on increases in the impact factor (IF) in 123 journals from the Journal Citation Reports database in which this scientometric indicator had decreased during the previous four years. In general, we did not find evidence that abuse of journal self-citations contributed to the increase in the impact factor after several years of decreases.

Keywords: Citations, Impact, Index, Labeled Editorial Material, Recovery, Self-Citations

? Braun, T., Schubert, A. and Glänzel, W. (2010), Untitled. *Scientometrics*, **82** (1), 3.

Full Text: [2010\Scientometrics82, 3.pdf](2010/Scientometrics82,%203.pdf)

? Chang, P.L., Wu, C.C. and Leu, H.J. (2010), Using patent analyses to monitor the technological trends in an emerging field of technology: A case of carbon nanotube field emission display. *Scientometrics*, **82** (1), 5-19.

Full Text: [2010\Scientometrics82, 5.pdf](2010/Scientometrics82,%205.pdf)

Abstract: Carbon nanotube field emission display (CNT-FED) represents both emerging application of nanotechnology and revolutionary invention of display. Therefore, it is an important subject to monitor the states and trends of CNT-FED technology before the next stage of development. The present paper uses patent bibliometric analysis and patent network analysis to monitor the technological trends in the field of CNT-FED. These results firstly reveal the different aspects of patenting activities in the field of CNT-FED. Then, patent network analysis indicates the developing tendency of worldwide FED production based on the synthesis of CNT materials. Furthermore, key technologies of three clusters can be identified as the depositing CNT on substrate, coating phosphor on screen and assembling process for whole device. Finally, emitter material is taken for the key factor in R&D work to improve the efficacy in CNT-FED technology.

Keywords: Bibliometric, Bibliometric Analysis, Carbon, Carbon Nanotube Field Emission Display (CNT-FED), Citations, Indicators, Nanotechnology, Network Analysis, Patent, Patent Bibliometric Analysis, Patent Network Analysis, Patterns, R&D, Science-and-Technology, Technology

? Liu, C.Y. and Wang, J.C. (2010), Forecasting the development of the biped robot walking technique in Japan through S-curve model analysis. *Scientometrics*, **82** (1), 21-36.

Full Text: [2010\Scientometrics82, 21.pdf](2010/Scientometrics82,%2021.pdf)

Abstract: Patents contain much significant technical information which can serve as an indicator of technological and economical development. This study attempts to forecast the development of the biped robot walking technique in Japan by use of the patent data obtained from the Japan Patent Office. The study applies linear regression to the patent data using three S-curve models developed by Loglet Lab, Pearl, and Gompertz individually. Various parameters inherent to each model including the least sum of modulus error and the least mean of square error of the model are analyzed. The most appropriate model for measuring the inflection point, the growth and the saturation time of the technique is described. Based on the Gompertz model analysis, this study finds that the biped robot walking technique will continue to develop for several decades in Japan and the saturation period is estimated to be around the year 2079-2082. This finding can help related researchers and managers in the robot field to foresee the development trend of the biped robot walking technique in this century.

Keywords: Forecast, Linear Regression, Logistic Growth, Loglet Lab Software, Patent, Patent Growth Trend, Researchers, S Curve, Science, The Walking Technique of the Biped Robot

? Chiu, Y.C., Lai, H.C., Liaw, Y.C. and Lee, T.Y. (2010), Technological scope: Diversified or specialized. *Scientometrics*, **82** (1), 37-58.

Full Text: [2010\Scientometrics82, 37.pdf](2010/Scientometrics82,%2037.pdf)

Abstract: Although the topic of technological diversification has been a major source of research, only a few studies have explored the determinant variables of technological scope decisions. The present study enhances our understanding of the determinants of a firm’s technological scope strategy. After reviewing the related literatures, we proposed and empirically tested a conceptual model from the perspective of the firm’s environment, strategic orientation, and resources. The results suggest that the coherence between technological scope decisions and proposed model is significantly related to performance.

Keywords: Capabilities, Causal Model, Dimensions, Firm Performance, Impact, Japanese Industry, Organization, Research, Research-And-Development, Strategy, Task Environments, Technological Diversification, Technological Scope, Technological Specialization, Topic

? Chadha, A. and Oriani, R. (2010), R&D market value under weak intellectual property rights protection: The case of India. *Scientometrics*, **82** (1), 59-74.

Full Text: [2010\Scientometrics82, 59.pdf](2010/Scientometrics82,%2059.pdf)

Abstract: The relationship between R&D and market value has attracted the interest of many scholars within different fields, but scant attention has been paid to the countries with weak protection of intellectual property rights (IPR). This is unfortunate, since this problem is potentially highly relevant for IPR policy in developing countries. In particular, several questions arise when the problem of R&D market value is analyzed in a country where IPR protection is weak. First, there are concerns regarding incentives (i.e., private returns) for firms to invest in R&D when IPR is only weakly protected. Second, significant differences could emerge in the market valuation of R&D investments of domestic and foreign firms, above all in those industries where spillovers are more likely. To examine these issues, this paper investigates the market valuation of R&D investments of a panel of 219 R&D-reporting domestic and foreign firms publicly traded in India with an empirical analysis. First, the market valuation of the R&D capital for the whole sample is positive and higher than those obtained in U.S. or European countries from similar analyses. Second, in the sub-samples of the domestic and foreign firms, the market value of R&D investments of foreign firms is not significantly different from zero, while the valuation coefficient of domestic firms is four times higher than that obtained on the whole sample. Third, in science-based industries the difference between domestic and foreign firms is smaller than in the other industries. The policy implications of these findings are discussed.

Keywords: Appropriability, Developing Countries, Foreign Direct-Investment, India, Innovation, Ipr Protection, Liberalization, Manufacturing Firms, Market Value, Multinational-Enterprises, Patents, Performance, Positive, R&D, Spillovers, Technology

? Chen, Y.S. and Chang, K.C. (2010), Analyzing the nonlinear effects of firm size, profitability, and employee productivity on patent citations of the US pharmaceutical companies by using artificial neural network. *Scientometrics*, **82** (1), 75-82.

Full Text: [2010\Scientometrics82, 75.pdf](2010/Scientometrics82,%2075.pdf)

Abstract: This study utilized artificial neural network (ANN) to explore the nonlinear influences of firm size, profitability, and employee productivity upon patent citations of the US pharmaceutical companies. The results showed that firm size, profitability, and employee productivity of the US pharmaceutical companies had the nonlinearly and monotonically positive influences upon their patent citations. Therefore, if US pharmaceutical companies want to enhance their innovation performance, they should pay attention on their firm size, profitability, and employee productivity.

Keywords: Citations, Competences, Employee Productivity, Firm Size, Innovation, Patent, Patent Citations, Performance, Positive, Profitability, Science, Technology

? Lee, Y.G. (2010), Sectoral strategic differences of technological development between electronics and chemistry: A historical view from analyses of Korean-invented US patents during the period of 1989-1992. *Scientometrics*, **82** (1), 83-92.

Full Text: [2010\Scientometrics82, 83.pdf](2010/Scientometrics82,%2083.pdf)

Abstract: Because R&D conducted in electronics and chemistry has made significant contributions to South Korean economic development, past strategies in technology developments in these fields are addressed. The possibility of capturing national technology strategy and policy characteristics from patent analyses is explored. For the analysis, data were analyzed from 557 US patents in electronics and 108 US patents in chemistry, registered by Korean inventors, between 1989 and 1992. Descriptive statistics of aggregated patent information were equivalently mapped to each strategy in the two fields. Industry-specific features and past technology strategies in electronics and chemistry are identified. Electronics was driven by the private sector, while chemistry was driven by the public sector. Inventors in both fields are seeking clustered innovation on which subsequent innovation can be accumulated and/or applied to numerous heterogeneous fields. Contrary to the stated assumption, many Korean electronic innovations were based on scientific outputs such as papers. Of the knowledge strategy variables, size of invention and number of heterogeneous classifications are considered to be an important factor that affects patent citation counts in both fields.

Keywords: Citation, Citation Counts, Electronics and Chemistry, Intellectual Property, Knowledge, Model, Patent, Patent Analyses, Patent Citation Counts, Patents, R&D, Statistics, Strategic Differences, Technological Development, Technology, Technology Strategies

? Klitkou, A. and Gulbrandsen, M. (2010), The relationship between academic patenting and scientific publishing in Norway. *Scientometrics*, **82** (1), 93-108.

Full Text: [2010\Scientometrics82, 93.pdf](2010/Scientometrics82,%2093.pdf)

Abstract: This paper adds to the growing empirical evidence on the relationship between patenting and publishing among university employees. Data from all Norwegian universities and a broad set of disciplines is used, consisting of confirmed patent inventors and group of peers without patents matched to the inventors by controlling for gender, age, affiliation and position. In general, the findings support earlier investigations concluding that there is a positive relationship between patenting and publishing. There are, however, important differences among fields, universities and possibly types of academic entrepreneurs, underscoring the need to look at nuanced and contextual factors when investigating the effects of patenting.

Keywords: Academic Entrepreneurship, Academic Patenting, Commercialisation of Research, Commercialization, Entrepreneurial, Genetics, Industry, Knowledge, Patent, Patents, Performance, Positive, Publishing, Researchers, Science, Scientific Publishing, Technology, Universities

? Lo, S.C.S. (2010), Scientific linkage of science research and technology development: A case of genetic engineering research. *Scientometrics*, **82** (1), 109-120.

Full Text: [2010\Scientometrics82, 109.pdf](2010/Scientometrics82,%20109.pdf)

Abstract: In this study, the author tried to demonstrate the linkage between science research and technology development through non-patent citation analysis to reveal that the important knowledge resources from science research had significant impact on technology development. Genetic engineering technology was the field examined in this study. From the references listed in the patents, it was observed that the technology development in genetic engineering was influenced heavily by the research done by public sector. Over 90% of the citations were non-patent literatures, and the majority of non-patent citations were journal articles. Citing preferences, such as country preference and institute preference were observed from the data included in this study.

Keywords: Articles, Basic Science Research, Bibliometrics, Citation, Citation Analysis, Citations, Growth-Rates, Impact, Innovation, Non-Patent Citation, Patents, Public Science, Research, Science, Scientific Linkage, Technology, Technology Development

? Hung, S.W. and Wang, A.P. (2010), Examining the small world phenomenon in the patent citation network: A case study of the radio frequency identification (RFID) network. *Scientometrics*, **82** (1), 121-134.

Full Text: [2010\Scientometrics82, 121.pdf](2010/Scientometrics82,%20121.pdf)

Abstract: Despite strategic research has been done in recent years to study how network topology shapes the evolution of competition in various industries, previous researches do not investigate the importance of high betweenness point on the connectivity of patent citation networks. The goal of this report is to examine and characterize the small world phenomenon in the patent citations network by analyzing the data of RFID patents. The results suggest that the patent citation network can indeed be characterized as “small world”. Additionally, the patent citation network resembles the power-law connectivity distribution and exhibits preferential connectivity behavior. In other words, a few key patents have a great many more connections than the majority of patents with few connections. Furthermore, the patents of high betweenness centrality were identified. It is found that 81% of the patent citation activities have relations with the patents of high betweenness centrality. The result of this analysis will provide a specific way for managers to identify key patents, to map their own patent deployment and to derive insight into the best ways to navigate within such networks.

Keywords: Behavior, Betweenness Centrality, Betweenness Centrality, Biotechnology Industry, Capabilities, Citation, Citation Network, Citations, Competition, Dynamics, Firms, Innovation, Knowledge Spillovers, Patent, Patent Citation, Patents, Radio Frequency Identification, Research, Sector, Small World Network

? Lee, Y.G. and Lee, J.H. (2010), Different characteristics between auctioned and non-auctioned patents. *Scientometrics*, **82** (1), 135-148.

Full Text: [2010\Scientometrics82, 135.pdf](2010/Scientometrics82,%20135.pdf)

Abstract: In recent years, firms have increased their use of internal and external knowledge through intermediaries. Knowledge brokers match buyers and sellers in the technology marketplace as well as connect and combine existing knowledge. We discuss how financial incentives in the technology marketplace can address challenges to open innovation, and how the marketplace could make individual inventors essential contributors. And then, we identify the key determinants of intellectual-property auction bids and different characteristics of auctioned and non-auctioned patents. Relevance, the scope of patents, and other factors suggested in the literature impact patent auctions, as mediated by knowledge brokers.

Keywords: Citations, Impact, Innovation, Intermediaries, Literature, Market, Marketplace for Technology, Open Innovation, Patent, Patent Auctions, Patent Characteristics, Patents, Technology

? Chen, D.Z., Lin, C.P., Huang, M.H. and Huang, C.Y. (2010), Constructing a new patent bibliometric performance measure by using modified citation rate analyses with dynamic backward citation windows. *Scientometrics*, **82** (1), 149-163.

Full Text: [2010\Scientometrics82, 149.pdf](2010/Scientometrics82,%20149.pdf)

Abstract: The objective of this research is to develop a new patent bibliometric performance measure by using modified citation rate analyses with dynamic backward citation windows. Cited half-life employed in bibliometrics was adopted in order to establish a model of annual patent backward citation windows. Based on the dynamic behavior of backward citation windows, the annual backward patent citation rates for each technology domain can be calculated to measure its bibliometric performance. It was found that the dynamic backward citation window represents more accurately the citation cycle time which is a key factor on technology assessment. Because different technology domain may have disparate attributes, a normalized backward citation rate was developed to measure the corresponding rank for each domain respect to the entire industry. Three technology domains were then chosen for demonstrative case studies which represent semiconductor, LCD, and drug industries.

Keywords: Assessment, Bibliometric, Bibliometrics, Case Studies, Citation, Citation Rate Analysis, Cited Half-Life, Dynamic Backward Citation Window, Impact Factors, Journals, Patent, Patent Bibliometric Performance Measure, Research, Science, Technology

? Guan, J.C. and Chen, K.H. (2010), Modeling macro-R&D production frontier performance: An application to Chinese province-level R&D. *Scientometrics*, **82** (1), 165-173.

Full Text: [2010\Scientometrics82, 165.pdf](2010/Scientometrics82,%20165.pdf)

Abstract: This paper proposes a novel methodological framework for effectively measuring the production frontier performance (PFP) of macro-scale (regional or national) R&D activities themselves associated with two improved models: a non-radial data envelopment analysis (DEA) model and a nonradial Malmquist index. In particular, the framework can provide multidimensional information to benchmark various R&D efficiency indexes (i.e., technical efficiency, pure technical efficiency and scale efficiency) as well as the total factor R&D productivity change (determined by three components: “catch-up” of R&D efficiency, “frontier shift” of R&D technology as well as “exploitation” of R&D scale economics effect) at a comparable production frontier. It can be used to not only investigate the potential and sustainable capacity of innovation but also screen and finance R&D projects at the regional or national level. We have applied the framework to a province-level panel dataset on R&D activities of 30 selected Chinese provinces.

Keywords: Capacity, Cross-Country, Data Envelopment Analysis, Development Efficiency, Growth, Industrialized Countries, Non-Radial Data Development Analysis, Non-Radial Malmquist Index, Patents, Production Frontier Performance, R&D, R&D Activities, Technical Progress, Technology

? Cheng, Y.H., Kuan, F.Y., Chuang, S.C. and Ken, Y. (2010), Profitability decided by patent quality? An empirical study of the US semiconductor industry. *Scientometrics*, **82** (1), 175-183.

Full Text: [2010\Scientometrics82, 175.pdf](2010/Scientometrics82,%20175.pdf)

Abstract: The investment in research and development (R&D) for semiconductor industry is never small as the technology cycle time (TCT) is relatively short comparing to other industries, thus a semiconductor company requires lots of technological innovations and capital offerings to maintain. The semiconductor industry contributes primarily part of the micro-electronic industries. Advancing technology and patent application are the centre of attention within the semiconductor sector. This research examines the relationship between patent quality and the profits a patent creates for a company in this selected field. This study distinguishes itself from prior research by including cross-sectional data, time series data to simultaneously collect and analyze. The study result shows that some indicators of patent quality are statistically significant to return on assets.

Keywords: Patent, Patent Citation, Patent Quality, Profitability, R&D, Research, Research and Development, Technology

? Frietsch, R. and Schmoch, U. (2010), Transnational patents and international markets. *Scientometrics*, **82** (1), 185-200.

Full Text: [2010\Scientometrics82, 185.pdf](2010/Scientometrics82,%20185.pdf)

Abstract: Patent statistics are a frequently used innovation indicator for the description and analysis of technological strengths and weaknesses, both on the macro and the micro level. Patent data has a broad coverage, high reliability, allows a very differentiated perspective and the data has become easier in availability and accessibility. Especially when cross country comparisons and comparative assessments are intended, a deep knowledge and understanding of patent systems is required. In the 1990s Triadic patents, which were able to balance the home advantage of domestic applicants/inventors. An increasing internationalisation and globalisation makes it also necessary to adapt the patent analyses to this new world order. In this paper the so called Transnational patents are suggested, which allows to grasp the new relations and relative positions between the industrialised, industrialising and emerging countries. The existing concepts are presented and discussed and contrasted against the concept of Transnational Patents.

Keywords: Coverage, Globalisation, Indicators, Innovative Activities, Patent, Patent Statistics, Patents, Statistics, Transnational Patents, Triadic Patents

? Chen, Y.S. and Chang, K.C. (2010), The nonlinear nature of the relationships between the patent traits and corporate performance. *Scientometrics*, **82** (1), 201-210.

Full Text: [2010\Scientometrics82, 201.pdf](2010/Scientometrics82,%20201.pdf)

Abstract: This study utilizes neural network to explore the nonlinear relationships between corporate performance and the patent traits measured from Herfindahl-Hirschman Index of patents (HHI of patents), patent citations, and relative patent position in the most important technological field (RPPMIT) in the US pharmaceutical industry. The results show that HHI of patents and RPPMIT have nonlinearly and monotonically positive influences upon corporate performance, while the influence of patent citations is nonlinearly U-shaped. Therefore, pharmaceutical companies should raise the degrees of the leading position in their most important technological fields and the centralization of their technological capabilities to enhance corporate performance.

Keywords: Citations, Corporate Performance, HHI of Patents, Patent, Patent Analysis, Patent Citations, Patents, Portfolios, Positive, Relative Patent Position (RPP), Research-and-Development, Science, Technology

? Lazaridis, T. (2010), Ranking university departments using the mean h-index. *Scientometrics*, **82** (2), 211-216.

Full Text: [2010\Scientometrics82, 211.pdf](2010/Scientometrics82,%20211.pdf)

Abstract: Ranking of universities has lately received considerable attention. However, ranking of departments would give a higher resolution picture of the distribution of quality within each university. In this work the Hirsch (h) index of each faculty in Greek Chemistry, Chemical Engineering, Materials Science, and Physics departments was calculated using the Web of Science and the mean value was used to rank them. This ranking refers to the research performance of each department and thus is most relevant to its doctoral program. The results seem highly meaningful. If performed on a pan-European basis, such rankings could spur healthy competition and could provide a strong motive for meritocratic hiring practices. Technical difficulties and possible extension of this approach to social science and humanities departments are discussed.

Keywords: Author, Bibliometric Indicators, Chemical Engineering, Chemistry, Competition, Greece, h Index, h-Index, Hirsch-Index, Humanities, Journals, Materials Science, Physics, Ranking, Rankings, Research, Research Output, Research Performance, Science, Scientific-Research, Universities, Web Of Science

? Bass, S.D. and Kurgan, L.A. (2010), Discovery of factors influencing patent value based on machine learning in patents in the field of nanotechnology. *Scientometrics*, **82** (2), 217-241.

Full Text: [2010\Scientometrics82, 217.pdf](2010/Scientometrics82,%20217.pdf)

Abstract: Patents represent the technological or inventive activity and output across different fields, regions, and time. The analysis of information from patents could be used to help focus efforts in research and the economy, however, the roles of the factors that can be extracted from patent records are still not entirely understood. To better understand the impact of these factors on patent value, machine learning techniques such as feature selection and classification are used to analyze patents in a sample industry, nanotechnology. Each nanotechnology patent was represented by a comprehensive set of numerical features that describe inventors, assignees, patent classification, and outgoing references. After careful design that included selection of the most relevant features, selection and optimization of the accuracy of classification models that aimed at finding most valuable (top-performing) patents, we used the generated models to analyze which factors allow to differentiate between the top-performing and the remaining nanotechnology patents. A few interesting findings surface as important such as the past performance of inventors and assignees, and the count of referenced patents.

Keywords: Citations, Classification, Evolution, Feature Selection, Impact, Indicators, Innovation, Machine Learning, Market Value, Measuring Progress, Models, Multiple Uses, Nanotechnology, Patent, Patent Value, Patents, Performance, Research, Science, Technology Field

? Egghe, L. (2010), A model showing the increase in time of the average and median reference age and the decrease in time of the Price Index. *Scientometrics*, **82** (2), 243-248.

Full Text: [2010\Scientometrics82, 243.pdf](2010/Scientometrics82,%20243.pdf)

Abstract: This paper proves two regularities that where found in the paper (LariviSre et al. (2007). Long-term patterns in the aging of the scientific literature, 1900-2004. In Proceedings of ISSI 2007. CSIC, Madrid, Spain, pp. 449-456.). The first is that the mean as well as the median reference age increases in time. The second is that the Price Index decreases in time. Using an exponential literature growth model we prove both regularities. Hence we show that the two results do not have a special informetric reason but that they are just a mathematical consequence of a widely accepted simple literature growth model.

Keywords: Aging, Exponential Growth, Growth, Literature, Mean Reference Time, Median Reference Time, Price Index, Scientific Literature, Spain

? Yu, G. and Li, Y.J. (2010), Identification of referencing and citation processes of scientific journals based on the citation distribution model. *Scientometrics*, **82** (2), 249-261.

Full Text: [2010\Scientometrics82, 249.pdf](2010/Scientometrics82,%20249.pdf)

Abstract: In this article, we firstly analyze the referencing process and the citation process of a scientific journal in theory, and find that the observed referencing or citation process includes the diffusing process and the aging process of cited literature and the publishing process of citing literature, thereby it is illuminated why the identified average publication delay ((T) over bar = T-s + tau) was longer than the observed value. Secondly, we compare the transfer function model of the observed citing process with other classical citation distribution models and find that the model is superior to others. Finally, using the model, we identify parameters of actual referencing and citation processes from data of age distributions of references and citations of 38 journals of neurology and applied mathematics in JCR, respectively, and then compare differences of identified parameters and obtain some interesting conclusions.

Keywords: Aging, Citation, Citation Distribution Model, Citations, Identification, Impact, Journals, Literature, Mathematics, Models, Publication, Publication Delay, Publication Delays, Publishing, Referencing, Referencing and Citation Processes, Scientific Journal, Scientific Journals, Theory

? Rafols, I. and Meyer, M. (2010), Diversity and network coherence as indicators of interdisciplinarity: case studies in bionanoscience. *Scientometrics*, **82** (2), 263-287.

Full Text: [2010\Scientometrics82, 263.pdf](2010/Scientometrics82,%20263.pdf)

Abstract: The multidimensional character and inherent conflict with categorisation of interdisciplinarity makes its mapping and evaluation a challenging task. We propose a conceptual framework that aims to capture interdisciplinarity in the wider sense of knowledge integration, by exploring the concepts of diversity and coherence. Disciplinary diversity indicators are developed to describe the heterogeneity of a bibliometric set viewed from predefined categories, i.e. using a top-down approach that locates the set on the global map of science. Network coherence indicators are constructed to measure the intensity of similarity relations within a bibliometric set, i.e. using a bottom-up approach, which reveals the structural consistency of the publications network. We carry out case studies on individual articles in bionanoscience to illustrate how these two perspectives identify different aspects of interdisciplinarity: disciplinary diversity indicates the large-scale breadth of the knowledge base of a publication, network coherence reflects the novelty of its knowledge integration. We suggest that the combination of these two approaches may be useful for comparative studies of emergent scientific and technological fields, where new and controversial categorisations are accompanied by equally contested claims of novelty and interdisciplinarity.

Keywords: Articles, Bibliometric, Bionanotechnology, Case Studies, Categories, Citation, Cocitation, Collaboration, Cross-Disciplinary, Diversity, Evaluation, Heterogeneity, Indicators, Integration, Interdisciplinary Research, Mapping, Nanoscience, Nanotechnology, Nanotechnology, Network Analysis, Publication, Publications, Research Areas, Science, Strategies

? Magerman, T., Van Looy, B. and Song, X.Y. (2010), Exploring the feasibility and accuracy of Latent Semantic Analysis based text mining techniques to detect similarity between patent documents and scientific publications. *Scientometrics*, **82** (2), 289-306.

Full Text: [2010\Scientometrics82, 289.pdf](2010/Scientometrics82,%20289.pdf)

Abstract: In this study, we examine and validate the use of existing text mining techniques (based on the vector space model and latent semantic indexing) to detect similarities between patent documents and scientific publications. Clearly, experts involved in domain studies would benefit from techniques that allow similarity to be detected-and hence facilitate mapping, categorization and classification efforts. In addition, given current debates on the relevance and appropriateness of academic patenting, the ability to assess content-relatedness between sets of documents-in this case, patents and publications-might become relevant and useful. We list several options available to arrive at content based similarity measures. Different options of a vector space model and latent semantic indexing approach have been selected and applied to the publications and patents of a sample of academic inventors (n = 6). We also validated the outcomes by using independently obtained validation scores of human raters. While we conclude that text mining techniques can be valuable for detecting similarities between patents and publications, our findings also indicate that the various options available to arrive at similarity measures vary considerably in terms of accuracy: some generally accepted text mining options, like dimensionality reduction and LSA, do not yield the best results when working with smaller document sets. Implications and directions for further research are discussed.

Keywords: Author-Inventor Relationships, Classification, Combining Full-Text, Information-Retrieval, Knowledge, Latent Semantic Analysis, Mapping, Patent, Patent-Publication Pairs, Patents, Performance, Publications, Rank, Research, Researchers, Science, Science-Technology Linkages, Scientific Publications, Space, Technology, Text Mining

? Perianes-Rodriguez, A., Olmeda-Gomez, C. and Moya-Anegon, F. (2010), Detecting, identifying and visualizing research groups in co-authorship networks. *Scientometrics*, **82** (2), 307-319.

Full Text: [2010\Scientometrics82, 307.pdf](2010/Scientometrics82,%20307.pdf)

Abstract: The present paper proposes a method for detecting, identifying and visualizing research groups. The data used refer to nine Carlos III University of Madrid departments, while the findings for the Communication Technologies Department illustrate the method. Structural analysis was used to generate co-authorship networks. Research groups were identified on the basis of factorial analysis of the raw data matrix and similarities in the choice of co-authors. The resulting networks distinguished the researchers participating in the intra-departmental network from those not involved and identified the existing research groups. Fields of research were characterized by the Journal of Citation Report subject category assigned to the bibliographic references cited in the papers written by the author-factors. The results, i.e., the graphic displays of the structures of the socio-centric and co-authorship networks and the strategies underlying collaboration among researchers, were later discussed with the members of the departments analyzed. The paper constitutes a starting point for understanding and characterizing networking within research institutions.

Keywords: Citation, Co-Authorship, Coauthorship, Cocitation, Collaboration, Community Structure, Graphs, Groups, Information Visualization, Intellectual Space, Network Analysis, Productivity, Research, Research Collaboration, Research Groups, Research Institutions, Researchers, Scientific Collaboration, Size, Structural

? Mikki, S. (2010), Comparing Google Scholar and ISI Web of Science for Earth Sciences. *Scientometrics*, **82** (2), 321-331.

Full Text: [2010\Scientometrics82, 321.pdf](2010/Scientometrics82,%20321.pdf)

Abstract: In order to measure the degree to which Google Scholar can compete with bibliographical databases, search results from this database is compared with Thomson’s ISI WoS (Institute for Scientific Information, Web of Science). For earth science literature 85% of documents indexed by ISI WoS were recalled by Google Scholar. The rank of records displayed in Google Scholar and ISI WoS, is compared by means of Spearman’s footrule. For impact measures the h-index is investigated. Similarities in measures were significant for the two sources.

Keywords: Citation Analysis, Citation Counts, Coverage, Database, Databases, Google Scholar, h Index, h-Index, Impact, Impact Measures, ISI, ISI Web, ISI Web of Science, Literature, Rankings, Science, Scopus, Similarity Measures, Web of Science

? Etxebarria, G. and Gomez-Uranga, M. (2010), Use of Scopus and Google Scholar to measure social sciences production in four major Spanish universities. *Scientometrics*, **82** (2), 333-349.

Full Text: [2010\Scientometrics82, 333.pdf](2010/Scientometrics82,%20333.pdf)

Abstract: A large part of Social Sciences and the Humanities do not adapt to international proceedings used in English for scientific output on databases such as the Web of Science and Scopus. The aim of this paper is to show the different results obtained in scientific work by comparing Social Sciences researchers with those of other sciences in four Spanish universities. The first finding is that some Social Sciences researchers are somewhat internationalised. However, the majority of individuals who are prestigious in their local academic-scientific community do not even appear on the information sources mentioned above.

Keywords: Citation, Databases, Google Scholar, Rankings, Researchers, Science, Scientific Output, Scopus, Social Sciences, Social Sciences Production, Spanish Universities, Universities, Visibility on International Databases, Web, Web of Science

? Ben-David, D. (2010), Ranking Israel’s economists. *Scientometrics*, **82** (2), 351-364.

Full Text: [2010\Scientometrics82, 351.pdf](2010/Scientometrics82,%20351.pdf)

Abstract: One of the more important measures of a scholar’s research impact is the number of times that the scholar’s work is cited by other researchers as a source of knowledge. This paper conducts a first of its kind examination on Israel’s academic economists and economics departments, ranking them according to the number of citations on their work. It also provides a vista into one of the primary reasons given by junior Israeli economists for an unparalleled brain drain from the country-discrepancies between research impact and promotion. The type of examination carried out in this paper can now be easily replicated in other fields and in other countries utilizing freely available citations data and compilation software that have been made readily accessible in recent years.

Keywords: Academic Economists, Author, Citations, Impact, Israel, Journals, Primary, Ranking, Rankings, Research, Researchers, Software

? Baccini, A. and Barabesi, L. (2010), Interlocking editorship. A network analysis of the links between economic journals. *Scientometrics*, **82** (2), 365-389.

Full Text: [2010\Scientometrics82, 365.pdf](2010/Scientometrics82,%20365.pdf)

Abstract: The exploratory analysis developed in this paper relies on the hypothesis that each editor possesses some power in the definition of the editorial policy of her journal. Consequently if the same scholar sits on the board of editors of two journals, those journals could have some common elements in their editorial policies. The proximity of the editorial policies of two scientific journals can be assessed by the number of common editors sitting on their boards. A database of all editors of ECONLIT journals is used. The structure of the network generated by interlocking editorship is explored by applying the instruments of network analysis. Evidence has been found of a compact network containing different components. This is interpreted as the result of a plurality of perspectives about the appropriate methods for the investigation of problems and the construction of theories within the domain of economics.

Keywords: Database, Economic Journals, Editorial Boards, Editorial Policies, Editorial-Boards, Favoritism, Gatekeepers, Interlocking Editorship, Journal Gatekeepers, Journals, Network Analysis, Networks, Rankings, Referees, Representation, Science, Scientific Collaboration, Scientific Journals, World

? Alonso, S., Cabrerizo, F.J., Herrera-Viedma, E. and Herrera, F. (2010), hg-index: A new index to characterize the scientific output of researchers based on the h- and g-indices. *Scientometrics*, **82** (2), 391-400.

Full Text: [2010\Scientometrics82, 391.pdf](2010/Scientometrics82,%20391.pdf)

Abstract: To be able to measure the scientific output of researchers is an increasingly important task to support research assessment decisions. To do so, we can find several different measures and indices in the literature. Recently, the h-index, introduced by Hirsch in 2005, has got a lot of attention from the scientific community for its good properties to measure the scientific production of researchers. Additionally, several different indicators, for example, the g-index, have been developed to try to improve the possible drawbacks of the h-index. In this paper we present a new index, called hg-index, to characterize the scientific output of researchers which is based on both h-index and g-index to try to keep the advantages of both measures as well as to minimize their disadvantages.

Keywords: Assessment, Bibliometric Indicators, G-Index, h Index, h-Index, Hg-Index, Hirsch-Index, Indicators, Literature, Ranking, Research, Research Evaluation, Researchers, Science, Scientific Output, Scientific Production

? Gingras, Y. and Wallace, M.L. (2010), Why it has become more difficult to predict Nobel Prize winners: A bibliometric analysis of nominees and winners of the chemistry and physics prizes (1901-2007). *Scientometrics*, **82** (2), 401-412.

Full Text: [2010\Scientometrics82, 401.pdf](2010/Scientometrics82,%20401.pdf)

Abstract: We propose a comprehensive bibliometric study of the profile of Nobel Prize winners in chemistry and physics from 1901 to 2007, based on citation data available over the same period. The data allows us to observe the evolution of the profiles of winners in the years leading up to-and following-nominations and awarding of the Nobel Prize. The degree centrality and citation rankings in these fields confirm that the Prize is awarded at the peak of the winners’ citation history, despite a brief Halo Effect observable in the years following the attribution of the Prize. Changes in the size and organization of the two fields result in a rapid decline of predictive power of bibliometric data over the century. This can be explained not only by the growing size and fragmentation of the two disciplines, but also, at least in the case of physics, by an implicit hierarchy in the most legitimate topics within the discipline, as well as among the scientists selected for the Nobel Prize. Furthermore, the lack of readily-identifiable dominant contemporary physicists suggests that there are few new paradigm shifts within the field, as perceived by the scientific community as a whole.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Study, Centrality, Citation, History, Nobel Prize, Paradigm, Rankings, Scientific Disciplines, Topics

? Quesada, A. (2010), More axiomatics for the Hirsch index. *Scientometrics*, **82** (2), 413-418.

Full Text: [2010\Scientometrics82, 413.pdf](2010/Scientometrics82,%20413.pdf)

Abstract: The Hirsch index is a number that synthesizes a researcher’s output. It is defined as the maximum number h such that the researcher has h papers with at least h citations each. Woeginger (Math Soc Sci 56: 224-232, 2008a, J Informetr 2: 298-303, 2008b) suggests two axiomatic characterizations of the Hirsch index using monotonicity as one of the axioms. This note suggests three characterizations without adopting the monotonicity axiom.

Keywords: Axiomatic Characterization, Citations, Hirsch Index, Publications, Research Quality

? Puuska, H.M. (2010), Effects of scholar’s gender and professional position on publishing productivity in different publication types. Analysis of a Finnish university. *Scientometrics*, **82** (2), 419-437.

Full Text: [2010\Scientometrics82, 419.pdf](2010/Scientometrics82,%20419.pdf)

Abstract: This paper examines the effects of a scholar’s position and gender on publishing productivity in several types of scientific publications: monographs, articles in journals, articles in edited books, and articles in conference proceedings. The data consist of 1,367 scholars who worked at the University of Helsinki, Finland, during the period 2002-2004. The analysis shows that professors are the most productive, PhDs publish more than non-PhDs, and men perform better than women, also when other scholarly characteristics are controlled for. These differences are greater for monographs and articles in edited books than for articles in journals. In terms of conference proceedings, no remarkable productivity differences were found.

Keywords: Academic Position, Age, Articles, Books, Collaboration, Faculty, Faculty Rank, Fields, Gender, Journals, Performance, Publication, Publications, Publishing, Publishing Productivity, Science, Scientific Productivity, Scientific Publications, Women

? Veugelers, R. (2010), Towards a multipolar science world: Trends and impact. *Scientometrics*, **82** (2), 439-456.

Full Text: [2010\Scientometrics82, 439.pdf](2010/Scientometrics82,%20439.pdf)

Abstract: This paper brings together recent statistical evidence on international (co-)publications and (foreign) PhD-students and scholars to document shifts in geographic sources of scientific production and the impact this has on flows of scientific talent and partnering for scientific collaboration. The evidence demonstrates that despite the continued dominance of the US and the increasing importance of the EU, the TRIAD is in relative decline. Other geographic sources of science outside the TRIAD are rising, both in quantity, but also, although still to a lesser extent, in quality. Especially China drives this non-TRIAD growth. This catching-up of non-TRIAD countries drives a slow but real process of global convergence. It nevertheless leaves a less equal non-TRIAD science community, as the growth of China, is not matched by other non-TRIAD countries. Despite the rise of China’s own scientific production, and the increasing return flows of overseas students and scholars, the outward flows of Asian talents have not diminished over time. The data suggest a high correlation between the patterns of international mobility of scientists and the patterns of international collaborations. The large and stable flow of Chinese human capital into the US forms the basis on which stable international US-Chinese scientific networks are built. With the EU lacking this Chinese human capital circulation, it is more difficult to build up similar strong and stable networks.

Keywords: China, Co-Authorship, Collaboration, Convergence, EU, Globalisation, Impact, International Co-Publications, International Mobility, Non-Triad, Science, Scientific Networks, Scientific Production, Trends

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Full Text: [2010\Scientometrics82, 459.pdf](2010/Scientometrics82,%20459.pdf)

? Vinkler, P. (2010), The pi(v)-index: a new indicator to characterize the impact of journals. *Scientometrics*, **82** (3), 461-475.

Full Text: [2010\Scientometrics82, 461.pdf](2010/Scientometrics82,%20461.pdf)

Abstract: For determining the eminence of scientific journals, a new indicator stressing the importance of papers in the “elite set” (i.e., highly cited papers) is suggested. The number of papers in the elite set (P (pi v)) is calculated with the equation: (10 log P) - 10, where P is the total number of papers in the set. The one-hundredth of citations (C) obtained by P (pi v) papers is regarded as the pi(v)-index which is field and time dependent. The pi(v)-index is closely correlated with the citedness (C/P) of P (pi v) papers, and it is also correlated with the Hirsch-index. Three types of Hirsch-sets are distinguished, depending on the relation of the number of citations received by the Hirsch-paper (ranked as h) and the paper next in rank (h + 1) by citation. The h-index of an Anomalous Hirsch-set (AH) may be increased by a single citation to a paper outside the Hirsch-core. (A set of papers may be regarded as AH, where the number of citations to the Hirsch-paper is higher than the h-index and the next paper in rank shows as many citations as the value of the h-index.).

Keywords: Citation, Citations, Elite Set, Eminence of Journals, h Index, h-Index, Highly Cited Papers, Hirsch Index, Hirsch-Index, Impact, Index, Information, Journals, Performance, Pi-Index, Science, Scientific Journals, Scientometric Indicators, Scientometric Indicators

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Full Text: [2010\Scientometrics82, 477.pdf](2010/Scientometrics82,%20477.pdf)

Abstract: The Ranking Web of World Repositories (http://repositories.webometrics.info) is introduced. The objective is to promote Open access initiatives (OAI) supporting the use of repositories for scientific evaluation purposes. A set of metrics based on web presence, impact and usage is discussed. The Ranking is built on indicators obtained from web search engines following a model close to the Impact Factor one. The activity accounts for a 50% of the index, including number of pages, pdf files and items in Google Scholar database, while the visibility takes into account the external inlinks received by the repository (the other 50%). The Ranking provides the Top 300 repositories from a total of 592 worldwide, with a strong presence of US, German and British institutional repositories and the leadership of the large subject repositories. Results suggest the need to take into consideration other file formats and the usage information, an option is not feasible today.

Keywords: Articles, Citation Advantage, Communication, Database, Evaluation, Google Scholar, Impact, Impact Factor, Indicators, Information, Institutional Repositories, Leadership, Metrics, Model, Open Access, Ranking, Repositories, Science, US, Usage, Visibility, Web, Webometrics

? Asemi, A. (2010), A citation analysis of Iranian journals to open access (OA) articles and journals. *Scientometrics*, **82** (3), 487-494.

Full Text: [2010\Scientometrics82, 487.pdf](2010/Scientometrics82,%20487.pdf)

Abstract: This study was survey on citation research of Open Access (OA) journals in English papers of Iranian universities journals during year 2007. The main purposes of this paper were: to examine the state of English papers in Iranian journals in Thomson Scientific Master Journal List (TSMJL), and to analyze their visibility through citations to OA journals in DOAJ database. In fact, the researcher has used of citation analysis technique of bibliometric and large-scale sociometric analyses on about 16,219 citations. The method followed in the first part of this study is obtaining data from e-journal articles which indexed in TSMJL, conducting descriptive analyses, and reporting the findings in tables and figures. In the second part of the study, DOAJ database is used to behaviour cited reference searches and other citation analyses. It found that there are 960 Iranian print-based journals and only 37 Iranian Journals was indexed in TSMJL. Sixteen English Journals in TSMJL of eight Iranian universities. Throughout sixteen journals only one journal didn’t publish during 2007 and there were 704 articles all over the fifteen journals. Using large-scale sociometric analyses on about 16,219 citations all over 15 journals, it is notable that number of journals without citation to DOAJ was 3,101 (99.7%) and the number of journals with citation to DOAJ was 9 (0.3%). It shows that there was huge difference between the journals which had citing to DOAJ and without citing to DOAJ.

Keywords: Age, Articles, Bibliometric, Citation, Citation Analysis, Citations, Database, DOAJ, Free Access, Iran, Journal, Journals, Open Access (OA) Journals, Referred Journals, Research, Sociometric Analysis, State, Thomson Scientific, Universities, Visibility

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Full Text: [2010\Scientometrics82, 495.pdf](2010/Scientometrics82,%20495.pdf)

Abstract: Google Scholar and Scopus are recent rivals to Web of Science. In this paper we examined these three citation databases through the citations of the book “Introduction to informetrics” by Leo Egghe and Ronald Rousseau. Scopus citations are comparable to Web of Science citations when limiting the citation period to 1996 and onwards (the citation coverage of Scopus)-each database covered about 90% of the citations located by the other. Google Scholar missed about 30% of the citations covered by Scopus and Web of Science (90 citations), but another 108 citations located by Google Scholar were not covered either by Scopus or by Web of Science. Google Scholar performed considerably better than reported in previous studies, however Google Scholar is not very “user-friendly” as a bibliometric data collection tool at this point in time. Such “microscopic” analysis of the citing documents retrieved by each of the citation databases allows us a deeper understanding of the similarities and the differences between the databases.

Keywords: Bibliometric, Bibliometric Data, Citation, Citations, Counts, Coverage, Data Collection, Database, Databases, Google Scholar, h-Index, Impact, Introduction to Informetrics, Science, Scopus, Web of Science, Web-of-Science

? Basu, A. (2010), Does a country’s scientific ‘productivity’ depend critically on the number of country journals indexed? *Scientometrics*, **82** (3), 507-516.

Full Text: [2010\Scientometrics82, 507.pdf](2010/Scientometrics82,%20507.pdf)

Abstract: In this paper, we examine the question whether it is meaningful to talk about the scientific productivity of nations based on indexes like the Science Citation Index or Scopus, when the journal set covered by them keeps changing with time. We hypothesize from the illustrative case of India’s declining productivity in the 1980s which correlated with a fall in its journals indexed, that an apparent increase/decrease in productivity for any country, based on observed change in its share of papers could, in fact, be an effect resulting from the inclusion of more/less journals from the country. To verify our hypothesis we have used SCIMAGO data. We found that for a set of 90 countries, the share of journals regressed on the share of papers gave a linear relationship that explained 80% of the variance. However, we also show that in the case of China’s unusual rise in world scientific productivity (to second rank crossing several other countries), there is yet another factor that needs to be taken into account. We define a new indicator-the JOURNAL PACKING DENSITY (JPD) or average number of papers in journals from a given country. We show that the packing density of Chinese journals has steadily increased over the last few years. Currently, Chinese journals have the highest ‘packing density’ in the world, almost twice the world average which is about 100 papers per journal per annum. The deviation of the JPD from the world average is another indicator which will affect so called ‘national productivities’ in addition to the number of national journals indexed. We conclude that in the context of a five fold increase in the number of journals indexed over 20 years, the simplistic notion of ‘scientific productivity’ as equivalent to papers indexed needs to be re-examined.

Keywords: Bibliometrics, China, China, Chinese Journals, Citation, Country Share, Density, India, India, Journal, Journals, Productivity, Publications, Science, Science Citation Index, Scientific Productivity, SCIMAGO, Scopus, Web of Science

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Full Text: [2010\Scientometrics82, 517.pdf](2010/Scientometrics82,%20517.pdf)

Abstract: This paper focuses on the study of self-citations at the meso and micro (individual) levels, on the basis of an analysis of the production (1994-2004) of individual researchers working at the Spanish CSIC in the areas of Biology and Biomedicine and Material Sciences. Two different types of self-citations are described: author self-citations (citations received from the author him/herself) and co-author self-citations (citations received from the researchers’ co-authors but without his/her participation). Self-citations do not play a decisive role in the high citation scores of documents either at the individual or at the meso level, which are mainly due to external citations. At micro-level, the percentage of self-citations does not change by professional rank or age, but differences in the relative weight of author and co-author self-citations have been found. The percentage of co-author self-citations tends to decrease with age and professional rank while the percentage of author self-citations shows the opposite trend. Suppressing author self-citations from citation counts to prevent overblown self-citation practices may result in a higher reduction of citation numbers of old scientists and, particularly, of those in the highest categories. Author and co-author self-citations provide valuable information on the scientific communication process, but external citations are the most relevant for evaluative purposes. As a final recommendation, studies considering self-citations at the individual level should make clear whether author or total self-citations are used as these can affect researchers differently.

Keywords: Bibliometric Indicators, Bibliometric Tools, Citation, Citation Analysis, Citation Counts, Citations, Co-Author, Collaboration, Disciplines, Impact, Index, Indicators, Individual Scientists, Macro, Meso-Level, Methods, Micro-Level, Output, Pay, Professional, Reduction, Researchers, Science Policy, Scientific Communication, Self-Citation, Self-Citations

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Full Text: [2010\Scientometrics82, 539.pdf](2010/Scientometrics82,%20539.pdf)

Abstract: We compare a new method for measuring research leadership with the traditional method. Both methods are objective and reliable, utilize standard citation databases, and are easily replicated. The traditional method uses partitions of science based on journal categories, and has been extensively used to measure national leadership patterns in science, including those appearing in the NSF Science & Engineering Indicators Reports and in prominent journals such as Science and Nature. Our new method is based on co-citation techniques at the paper level. It was developed with the specific intent of measuring research leadership at a university, and was then extended to examine national patterns of research leadership. A comparison of these two methods provides compelling evidence that the traditional method grossly underestimates research leadership in most countries. The new method more accurately portrays the actual patterns of research leadership at the national level.

Keywords: Accuracy, Citation, Classification, Co-Citation, Co-Citation Analysis, Comparison, Competencies, Databases, Indicators, Journal, Journals, Leadership, Map of Science, Maps, Methods, National Leadership, Nations, Paradigms, Research, Research Leadership, Science, Science Map, Techniques, University, World

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Full Text: [2010\Scientometrics82, 555.pdf](2010/Scientometrics82,%20555.pdf)

Abstract: Relationships between the journal download immediacy index (DII) and some citation indicators are studied. The Chinese full-text database CNKI is used for data collection. Results suggest that the DII can be considered as an independent indicator, but that it also has predictive value for other indicators, such as a journal’s h-index. In case a journal cannot yet have an impact factor-because its citation history within the database is too short-the DII can be used for a preliminary evaluation. The article provides results related to the CNKI database as a whole and additionally, some detailed information about agricultural and forestry journals.

Keywords: Agricultural And Forestry Journals, Citation, Data Collection, Database, Download Immediacy Index, Evaluation, Full-Text Databases, h Index, h-Index, History, Impact, Impact Factor, Indicators, Journal, Journal Evaluation Indicators, Journal Immediacy Index, Journals

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Full Text: [2010\Scientometrics82, 567.pdf](2010/Scientometrics82,%20567.pdf)

Abstract: It is the objective of this article to examine in which aspects journal usage data differ from citation data. This comparison is conducted both at journal level and on a paper by paper basis. At journal level, we define a so-called usage impact factor and a usage half-life in analogy to the corresponding Thomson’s citation indicators. The usage data were provided from Science Direct, subject category “oncology”. Citation indicators were obtained from JCR, article citations were retrieved from SCI and Scopus. Our study shows that downloads and citations have different obsolescence patterns. While the average cited half-life was 5.6 years, we computed a mean usage half-life of 1.7 years for the year 2006. We identified a strong correlation between the citation frequencies and the number of downloads for our journal sample. The relationship was lower when performing the analysis on a paper by paper basis because of existing variances in the citation-download-ratio among articles. Also the correlation between the usage impact factor and Thomson’s journal impact factor was “only” moderate because of different obsolescence patterns between downloads and citations.

Keywords: Articles, Citation, Citations, Cited Half-Life, Comparison, Impact, Impact Factor, Indicators, Journal, Journal Impact, Journal Impact Factor, Journal Metrics, Journals, Metrics, Obsolescence, Oncology, Sci, Science, Scopus, Usage Half-Life, Usage Impact Factor

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Full Text: [2010\Scientometrics82, 581.pdf](2010/Scientometrics82,%20581.pdf)

Abstract: A term map is a map that visualizes the structure of a scientific field by showing the relations between important terms in the field. The terms shown in a term map are usually selected manually with the help of domain experts. Manual term selection has the disadvantages of being subjective and labor-intensive. To overcome these disadvantages, we propose a methodology for automatic term identification and we use this methodology to select the terms to be included in a term map. To evaluate the proposed methodology, we use it to construct a term map of the field of operations research. The quality of the map is assessed by a number of operations research experts. It turns out that in general the proposed methodology performs quite well.

Keywords: Authorship, Automatic Term Identification, Bibliometric, Bibliometric Mapping, Citation Patterns, Mapping, Maps, Operational-Research, Operations Research, Probabilistic Latent Semantic Analysis, Research, Science, Term Map

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Full Text: [2010\Scientometrics82, 597.pdf](2010/Scientometrics82,%20597.pdf)

Abstract: It has been about 30 years since China adopted an open-up and reform policy for global competition and collaboration. This opening-up policy is accompanied by a spectacular growth of the country’s economy as well as visibility in the world’s scientific literature. Also China’ competitiveness in scientific research has grown, and is mirroring the development of the country’s economy. On the other hand, international collaboration of most countries dramatically increased during the last two decades and accompanied the growth of science in emerging economies. Thus the question arises of whether growth of competitiveness in research is accompanied by an intensification of collaboration in China as well. In the present study we analyse the dynamics and the national characteristics of China’s co-operation in a global context. We also study research profile and citation impact of international collaboration with respect to the corresponding domestic ‘standards’.

Keywords: Brazil, Characteristics, China, Citation, Citation Impact, Co-Authorship, Collaboration, Competition, Global, Growth, Impact, International Collaboration, International Cooperation, Literature, Research, Research Profile, Science, Scientific Literature, Scientific Research, Standards, Subject Normalisation, Subject Profiles, Visibility, World

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Full Text: [2010\Scientometrics82, 613.pdf](2010/Scientometrics82,%20613.pdf)

Abstract: This article introduces the Impact Factor squared or IF2-index, an h-like indicator of research performance. This indicator reflects the degree to which large entities such as countries and/or their states participate in top-level research in a field or subfield. The IF2-index uses the Journal Impact Factor (JIF) of research publications instead of the number of citations. This concept is applied to other h-type indexes and their results compared to the IF2-index. These JIF-based indexes are then used to assess the overall performance of cancer research in Australia and its states over 8 years from 1999 to 2006. The IF2-index has three advantages when evaluating larger research units: firstly, it provides a stable value that does not change over time, reflecting the degree to which a research unit participated in top-level research in a given year, secondly, it can be calculated closely approximating the publication date of yearly datasets, and finally, it provides an additional dimension when a full article-based citation analysis is not feasible. As the index reflects the degree of participation in top-level research it may favor larger units when units of different sizes are compared.

Keywords: A-Index, Australia, Bibliometric Indicators, Cancer, Cancer Research, Citation, Citation Analysis, Citations, h-Index, h-Like Indexes, H-Type Indexes, Hirsch-Type Indexes, IF2-Index, Impact, Impact Factor, Indicators, Journal Impact Factor, Level, Publication, Publications, Quality, R-Index, Research, Research Evaluation, Research Performance, Researchers, Scientific Performance, Scientometrics

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Full Text: [2010\Scientometrics82, 627.pdf](2010/Scientometrics82,%20627.pdf)

Abstract: In this study we investigate the scientific output of Yugoslavia and its successor republics viz. Serbia, Croatia, Slovenia, Bosnia & Herzegovina, Macedonia and Montenegro. Additionally, Kosovo was included as a separate entity, since it recently declared its independence. The publications and cooperation between the republics are analyzed for the years from 1970 until 2007. In contrast to similar studies, we examine a larger time window and take into consideration not only the three big republics (Serbia, Croatia, and Slovenia) but also include the smaller ones, namely Bosnia & Herzegovina, Macedonia and Montenegro. For our analysis we introduce two new indicators: the normalized cooperation score (R-i((cs)))and the dominance factor (D-i((c))), a measure of dominance within a weighted network. Furthermore, we develop and assess the reliability of various techniques for visualizing our findings. We found that the civil wars had a severe impact on the inner-Yugoslav cooperation network. Additionally it seems, as if with the ending of the conflicts a process of recovery started.

Keywords: Bibliometrics, Cooperation Analysis, Croatia, Dominance Factor, Impact, Impact of Social Crises, Indicators, Journals, Network Analysis, Publications, Recovery, Reliability, Science, Scientific Cooperation, Scientific Output, Techniques, Yugoslavia

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Full Text: [2010\Scientometrics82, 647.pdf](2010/Scientometrics82,%20647.pdf)

Abstract: In advanced methods of delineation and mapping of scientific fields, hybrid methods open a promising path to the capitalisation of advantages of approaches based on words and citations. One way to validate the hybrid approaches is to work in cooperation with experts of the fields under scrutiny. We report here an experiment in the field of genomics, where a corpus of documents has been built by a hybrid citation-lexical method, and then clustered into research themes. Experts of the field were associated in the various stages of the process: lexical queries for building the initial set of documents, the seed, citation-based extension aiming at reducing silence, final clustering to identify noise and allow discussion on border areas. The analysis of experts’ advices show a high level of validation of the process, which combines a high-precision and low-recall seed, obtained by journal and lexical queries, and a citation-based extension enhancing the recall. This findings on the genomics field suggest that hybrid methods can efficiently retrieve a corpus of relevant literature, even in complex and emerging fields.

Keywords: Bibliographic Coupling, Bibliometrics, Citation Methods, Citations, Clustering, Complex, Delimitation, Field Delineation, Genomics, Information Retrieval, Interaction, Journal, Literature, Mapping, Methods, Nanosciences, Noise, Recall, Research, Science Mapping, Validation

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Full Text: [2010\Scientometrics82, 663.pdf](2010/Scientometrics82,%20663.pdf)

Abstract: Following up the European project PromTech the aim of which was to detect emerging technologies by studying the scientific literature, we chose one field, Molecular Biology, to identify and characterize emerging topics within that domain. We combined two analytical approaches: the first one introduces a model of the terminological evolution of the field based on bibliometric indicators and the second one operates a diachronic clustering analysis. Our objective is to bring answers to questions such as: Which technological aspects can be detected? Which of them are already established and which of them are new? How are the topics linked to each other?

Keywords: Bibliometric, Bibliometric Indicators, Characterisation, Clustering, Diachronic Cluster Analysis, Diffusion Model, Emerging Technologies, Evolution, Identification, Indicators, Literature, Model, Scientific Literature, Terminology Evolution, Topics

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Full Text: [2010\Scientometrics82, 677.pdf](2010/Scientometrics82,%20677.pdf)

Abstract: Co-authored publications across sectors have been used as indicators of the triple helix model and more generally for the study of science-technology relations. However, how to measure the relationships among the three or more sectors is a technically difficult issue. Using mutual information as an indicator has proved to be effective, but it is not widely used. In this paper, we introduced phi coefficients and partial correlation as conventional indicators to measure the relationships among sectors on the basis of Japanese publication data in the ISI-databases. We also proposed a new approach of graphical modeling based on partial correlation for studying university-industry-government relationships and relationships with other sectors. The conventional indicators give results that are consistent with mutual information, which shows that collaborations among the three national sectors (U, I, G) are getting weaker and that members of these sectors tend to collaborate much more with foreign researchers. It is also shown that universities used to play the central role in the national publication system and acted as a bridge between national sectors and foreign researchers. However, since 2000, the situation has been changing. The center of the Japanese research network is becoming more “foreign” oriented.

Keywords: Co-Authorship, Comparison, Dynamics, Government Relations, Graphical Modeling, Indicators, Innovation, Innovation System, Model, Modeling, Mutual Information, Partial Correlation Coefficient, Publication, Publications, Research, Researchers, System, Triple Helix, Triple-Helix, Universities, University

? Zhang, L., Janssens, F., Liang, L.M. and Glänzel, W. (2010), Journal cross-citation analysis for validation and improvement of journal-based subject classification in bibliometric research. *Scientometrics*, **82** (3), 687-706.

Full Text: [2010\Scientometrics82, 687.pdf](2010/Scientometrics82,%20687.pdf)

Abstract: The objective of this study is to use a clustering algorithm based on journal cross-citation to validate and to improve the journal-based subject classification schemes. The cognitive structure based on the clustering is visualized by the journal cross-citation network and three kinds of representative journals in each cluster among the communication network have been detected and analyzed. As an existing reference system the 15-field subject classification by Glänzel and Schubert (Scientometrics 56:55-73, 2003) has been compared with the clustering structure.

Keywords: Bibliometric, Bibliometric Research, Classification, Cluster, Cluster Analysis, Clustering, Cocitation Analysis, Journal, Journal Cross-Citation, Journals, Mapping of Science, Networks, Research, Science, Scientific Journals, Scientometrics, Subject Classification, System, Validation

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Full Text: [2010\Scientometrics83, 1.pdf](2010/Scientometrics83,%201.pdf)

Abstract: Although there are many studies for quantifying the academic performance of researchers, such as measuring the scientific performance based on the number of publications, there are no studies about quantifying the collaboration activities of researchers. This study addresses this shortcoming. Based on three measures, namely the collaboration network structure of researchers, the number of collaborations with other researchers, and the productivity index of co-authors, two new indices, the RC-Index and CC-Index, are proposed for quantifying the collaboration activities of researchers and scientific communities. After applying these indices on a data set generated from publication lists of five schools of information systems, this study concludes with a discussion of the shortcomings and advantages of these indices.

Keywords: Co-Authorships, Collaboration, Collaboration Activities, Collaboration Evaluation, Collaboration Measures, Collaborative Networks, Economics, Empirical Data Analysis, Indices, Individual and Community Productivity, Information Systems, Ireland, Networks, Number of Publications, Productivity, Productivity Index, Publication, Publications, Research Output, Researchers, Scientific Performance, Social Network Analysis, Successive h-Indexes

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Full Text: [2010\Scientometrics83, 15.pdf](2010/Scientometrics83,%2015.pdf)

Abstract: Research fronts represent the most dynamic areas of science and technology and the areas that attract the most scientific interest. We construct a methodology to identify these fronts, and we use quantitative and qualitative methodology to analyze and describe them. Our methodology is able to identify these fronts as they form-with potential use by firms, venture capitalists, researchers, and governments looking to identify emerging high-impact technologies. We also examine how science and technology absorbs the knowledge developed in these fronts and find that fronts which maximize impact have very different characteristics than fronts which maximize growth, with consequences for the way science develops over time.

Keywords: Building-Blocks, Characteristics, Clusters, Co-Citation, Cocitation Analysis, Emerging Science, Field-Effect Transistors, Gamma-Secretase, Growth, Impact, Innovation, Intellectual Structure, Interdisciplinary Research, Knowledge, Organic Electronics, Quantitative, Research, Research Fronts, Researchers, Science, Science and Technology, Structural Aspects, Technology, Thin-Film Transistors

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Full Text: [2010\Scientometrics83, 39.pdf](2010/Scientometrics83,%2039.pdf)

Abstract: Witnessing a substantial growth rate in its scientific production, Iran is considered as one of the recently rising stars in scientific contribution scene. However, its impact in science progress is widely unknown, especially at global level. Studying Iran’s scholarly publications and recognition in SCI, the present communication tries to clarify the country’s science system performance using regression analyses and then to compare its performance to that of the world, using Relative Citation Rate (RCR) and Relative Subfield Citedness (RW). The results of the regression analyses reveal that although Iran displays considerable weaknesses in its performance, it is increasingly recognized as its outputs grow. According to the RCR values, Iran performed at/above the global level in 21 subfields. However, the RW values show that the country’s performance is above the global level in only two subfields. Although Iran is very far from an ideal situation, these evidences can be considered as heralds of a successful movement towards a wealthy scientific future.

Keywords: Citation, Citation Analysis, Citation Performance, Comparison, Contribution, Global, Growth, Impact, Iran, Output, Productivity, Publications, Regression, Scholarly Publications, SCI, Science, Science Citation Index, Scientific Production, System

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Full Text: [2010\Scientometrics83, 55.pdf](2010/Scientometrics83,%2055.pdf)

Abstract: Scientific and other non-patent references (NPRs) in patents are important tools to analyze interactions between science and technology. This paper organizes a database with 514,894 USPTO patents granted globally in 1974, 1982, 1990, 1998 and 2006. There are 165,762 patents with at least one reference to science and engineering (S&E) literature, from a total of 1,375,503 references. Through a lexical analysis, 71.1% of this S&E literature is classified by S&E fields. These data serve as the basis for the elaboration of global and national 3-dimensional matrices (technological domains, S&E fields and number of references). Three indicators are proposed to analyze these matrices, allowing us to identify patterns of structured growth that differentiate developed and non-developed countries. This differentiation informs suggestions for public policies for development, emphasizing the need for an articulation between the industrial and technological dimension and scientific side. The intertwinement of these two dimensions is a key component of developmental policies for the twenty-first century.

Keywords: Database, Global, Growth, Indicators, Innovation, Linkages, Literature, Patents, Public Research, Science, Science and Technology, Science and Technology Linkages, Stages of Economic Development, Systems of Innovation, Technology, Tools, USPTO

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Full Text: [2010\Scientometrics83, 77.pdf](2010/Scientometrics83,%2077.pdf)

Abstract: This study examines network topologies of interdisciplinary research relationships in science and technology (S&T) and investigates the relational linkages between the interdisciplinary relations and the quality of research performance. A network analysis was performed to evaluate the General Research Grant (GRG) program, an interdisciplinary research funding program of the Korea Science and Engineering Foundation (KOSEF), the dataset covered the 2002-2004 period. The analytical results reveal the hidden network structure of interdisciplinary research relationships and demonstrate that the quality of research performance might be enhanced not only by interdependent pressures placed on various research fields but also by accumulated research capabilities that are relatively difficult to access and reproduce by other research fields.

Keywords: Centrality, Citation Analysis, Coauthorship, Collaboration, Disciplinary, Funding, Government’S R&D Grant Program, Impact Factor, Indicators, Interdisciplinary, Interdisciplinary Research, Interdisciplinary Research Relationships, Korea, Network Analysis, Network Topology, Patterns, Pressures, R&D, Research, Research Funding, Research Performance, Science, Science and Technology, Scientific Journals, Technology

? Borrego, A., Barrios, M., Villarroya, A. and Olle, C. (2010), Scientific output and impact of postdoctoral scientists: A gender perspective. *Scientometrics*, **83** (1), 93-101.

Full Text: [2010\Scientometrics83, 93.pdf](2010/Scientometrics83,%2093.pdf)

Abstract: This paper analyses the scientific output and impact of 731 Ph.D. holders who were awarded their doctorate at Spanish universities between 1990 and 2002. The aim was to identify any differences in the amount of scientific output and the impact of publications, in terms of citations, according to gender. The analysis revealed no significant differences in the amount of scientific output between males and females. However, the proportion of female Ph.D. holders with no postdoctoral output was significantly higher than that of their male counterparts, and the median number of papers published after Ph.D. completion was also lower among women. As regards pre- and postdoctoral research, the data showed that early scientific output may be a good predictor of subsequent productivity in both gender groups. The results also indicated that articles by female Ph.D. holders were cited significantly more often, even when self-citations were excluded.

Keywords: Articles, Citations, Family, Gender Equality, Groups, Impact, Ph.D. Holders, Productivity, Publications, Research, Research Productivity, Science, Scientific Impact, Scientific Output, Self-Citations, Sex-Differences, Spain, Spanish Universities, Universities

? Vanecek, J., Fatun, M. and Albrecht, V. (2010), Bibliometric evaluation of the FP-5 and FP-6 results in the Czech Republic. *Scientometrics*, **83** (1), 103-114.

Full Text: [2010\Scientometrics83, 103.pdf](2010/Scientometrics83,%20103.pdf)

Abstract: Our study evaluates results and impacts of the Framework Programs (FP) 5 and 6 in the Czech Republic. Publications resulting from the FP projects had 42% higher mean citation rate and 77% more EU-25 collaborations than the Czech standards. Teams participating in the FP are better-than-average, because citation rate of all their papers is 21% higher than the Czech standards. The most striking finding is the marked influence of FP on research direction. After the project start, the participating teams published papers in ten new fields in which they did not publish before the project. In 45 other fields, more than 200% increase of papers was observed.

Keywords: Bibliometric, Bibliometric Evaluation, Citation, Citation Rate, EU Framework Program, Evaluation, Fields, International Collaborations, Publications, Research, Science, Standards

? Yan, E.J., Ding, Y. and Zhu, Q.H. (2010), Mapping library and information science in China: A coauthorship network analysis. *Scientometrics*, **83** (1), 115-131.

Full Text: [2010\Scientometrics83, 115.pdf](2010/Scientometrics83,%20115.pdf)

Abstract: This paper aims to identify the collaboration pattern and network structure of the coauthorship network of library and information science (LIS) in China. Using data from 18 core source LIS journals in China covering 6 years, we construct the LIS coauthorship network. We analyze the network from both macro and micro perspectives and identify some key features of this network: this network is a small-world network, and follows the scale-free character. In the micro-level, we calculate each author’s centrality values and compare them with citation counts. We find that centrality rankings are highly correlated with citation rankings. We also discuss the limitation of current centrality measures for coauthorship network analysis.

Keywords: Betweenness Centrality, China, Citation, Citation Counts, Citations, Co-Authorship Networks, Coauthorship Network, Collaboration, Community, Complex Network, Complex Networks, Core, Graph, Information Science, Journals, Library and Information Science, LIS, Network Analysis, Rankings, Science, Scientific Collaboration, Scientific Collaboration Networks, Social Network

? Martins, W.S., Goncalves, M.A., Laender, A.H.F. and Ziviani, N. (2010), Assessing the quality of scientific conferences based on bibliographic citations. *Scientometrics*, **83** (1), 133-155.

Full Text: [2010\Scientometrics83, 133.pdf](2010/Scientometrics83,%20133.pdf)

Abstract: Assessing the quality of scientific conferences is an important and useful service that can be provided by digital libraries and similar systems. This is specially true for fields such as Computer Science and Electric Engineering, where conference publications are crucial. However, the majority of the existing quality metrics, particularly those relying on bibliographic citations, has been proposed for measuring the quality of journals. In this article we conduct a study about the relative performance of existing journal metrics in assessing the quality of scientific conferences. More importantly, departing from a deep analysis of the deficiencies of these metrics, we propose a new set of quality metrics especially designed to capture intrinsic and important aspects related to conferences, such as longevity, popularity, prestige, and periodicity. To demonstrate the effectiveness of the proposed metrics, we have conducted two sets of experiments that contrast their results against a “gold standard” produced by a large group of specialists. Our metrics obtained gains of more than 12% when compared to the most consistent journal quality metric and up to 58% when compared to standard metrics such as Thomson’s Impact Factor.

Keywords: Bibliometrics, Citation Analysis, Citations, Classification, Digital Libraries, Impact, Impact Factor, Journal, Journals, Metrics, Publications, Ranking, Science

? Lang, P., Gouveia, F.C. and Leta, J. (2010), Site co-link analysis applied to small networks: A new methodological approach. *Scientometrics*, **83** (1), 157-166.

Full Text: [2010\Scientometrics83, 157.pdf](2010/Scientometrics83,%20157.pdf)

Abstract: The method of co-link was proposed in 1996 and since then it has been applied in many Webometric studies. Its definition refers to “page co-link analysis”, as links are provided by URLs or pages. This paper presents a new methodological approach, a “site co-link analysis”, to investigate relations in small networks. The Oswaldo Cruz Foundation institutes were used as a case study. The results indicate that the number of co-links provided by sites led to an increase of 133% in the sample analyzed. In a cluster analysis, three clusters were formed mainly for thematic reasons and four institutes remained isolated.

Keywords: Academic Web, Cluster, Cluster Analysis, Clustering Analysis, Co-Link Analysis, Framework, Internet, Networks, Oswaldo Cruz Foundation, Webometrics

? Jonkers, K. (2010), Models and orphans, concentration of the plant molecular life science research agenda. *Scientometrics*, **83** (1), 167-179.

Full Text: [2010\Scientometrics83, 167.pdf](2010/Scientometrics83,%20167.pdf)

Abstract: This article explores the concentration in the global plant molecular life science research output. In the past 15 years, especially the share of articles which refer to the model organism A. thaliana has increased rapidly. Citation analyses show an even greater rise in the importance of this organism. Attempts are discussed to come to a scientometric definition of model organisms. For this purpose a comparison is made with applied microbiology. However, few shared scientometric characteristics were found which could help characterise model organisms. A distinction between major economic organisms and model organisms will therefore continue to rely on qualitative data.

Keywords: Arabidopsis-Thaliana, Articles, Biotechnology, Characteristics, Citation, Comparison, Concentration, Crops, Economic, Genomics, Global, Model, Model Organism, Models, Orphan Crops, Plant Science, Research, Research Output, Science

? Schubert, T. and Sooryamoorthy, R. (2010), Can the centre-periphery model explain patterns of international scientific collaboration among threshold and industrialised countries? The case of South Africa and Germany. *Scientometrics*, **83** (1), 181-203.

Full Text: [2010\Scientometrics83, 181.pdf](2010/Scientometrics83,%20181.pdf)

Abstract: As scientific collaboration is a phenomenon that is becoming increasingly important, studies on scientific collaboration are numerous. Despite the proliferation of studies on various dimensions of collaboration, there is still a dearth of analyses on the effects, motives and modes of collaboration in the context of developing countries. Adopting Wallerstein’s world-system theory, this paper makes use of bibliometric data in an attempt to understand the pattern of collaboration that emerges between South Africa and Germany. The key argument is that we can expect the collaborative relationship between South Africa and Germany to be one that is shaped by a centre-periphery pattern. The analyses show that a theory of scientific collaboration building on the notion of marginality and centre-periphery can explain many facets of South African-German collaboration, where South Africa is a semi-peripheral region, a centre for the periphery, and a periphery for the centre.

Keywords: Africa, Bibliometric, Bibliometric Data, Centre-Periphery, Co-Authorship, Collaboration, Developing Countries, Germany, Marginality, Model, Publication Patterns, Science, Scientific Collaboration, South Africa, Theory

? Anastasiadis, A.D., de Albuquerque, M.P., de Albuquerque, M.P. and Mussi, D.B. (2010), Tsallis q-exponential describes the distribution of scientific citations-a new characterization of the impact. *Scientometrics*, **83** (1), 205-218.

Full Text: [2010\Scientometrics83, 205.pdf](2010/Scientometrics83,%20205.pdf)

Abstract: In this work we have studied the research activity for countries of Europe, Latin America and Africa for all sciences between 1945 and November 2008. All the data are captured from the Web of Science database during this period. The analysis of the experimental data shows that, within a nonextensive thermostatistical formalism, the Tsallis q-exponential distribution N(c) satisfactorily describes Institute of Scientific Information citations. The data which are examined in the present survey can be fitted successfully as a first approach by applying a single curve (namely, N(c) proportional to 1/[1 + (q - 1)c/T](1/q-1) with q similar or equal to 4/3 for all the available citations c, T being an “effective temperature”. The present analysis ultimately suggests that the phenomenon might essentially be one and the same along the entire range of the citation number. Finally, this manuscript provides a new ranking index, via the “effective temperature” T, for the impact level of the research activity in these countries, taking into account the number of the publications and their citations.

Keywords: Africa, Citation, Citations, Complex Systems, Database, Entropic Index, Europe, Impact, Initial Conditions, Journals, Latin America, Model, Nonextensive Entropy, Nonextensive Statistical-Mechanics, Productivity, Publications, Ranking, Research, Research Activity, Science, Sensitivity, System, Web of Science

? Jansen, D., von Gortz, R. and Heidler, R. (2010), Knowledge production and the structure of collaboration networks in two scientific fields. *Scientometrics*, **83** (1), 219-241.

Full Text: [2010\Scientometrics83, 219.pdf](2010/Scientometrics83,%20219.pdf)

Abstract: In this paper the relationship between knowledge production and the structure of research networks in two scientific fields is assessed. We investigate whether knowledge production corresponds positively or negatively with different types of social network structure. We show that academic fields generate knowledge in different ways and that within the fields, different types of networks act as a stimulant for knowledge generation.

Keywords: Astronomy, Astrophysics, Collaboration, Dynamics, Holes, Innovation, Knowledge, Knowledge Production, Multidisciplinarity, Nanoscience, Nanoscience, Nanotechnology, Networks, New Sciences, Perspective, Research, Research Collaboration, Science, Social Network Analysis

? Franceschet, M. (2010), A comparison of bibliometric indicators for computer science scholars and journals on Web of Science and Google Scholar. *Scientometrics*, **83** (1), 243-258.

Full Text: [2010\Scientometrics83, 243.pdf](2010/Scientometrics83,%20243.pdf)

Abstract: Given the current availability of different bibliometric indicators and of production and citation data sources, the following two questions immediately arise: do the indicators’ scores differ when computed on different data sources? More importantly, do the indicator-based rankings significantly change when computed on different data sources? We provide a case study for computer science scholars and journals evaluated on Web of Science and Google Scholar databases. The study concludes that Google scholar computes significantly higher indicators’ scores than Web of Science. Nevertheless, citation-based rankings of both scholars and journals do not significantly change when compiled on the two data sources, while rankings based on the h index show a moderate degree of variation.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Citation Analysis, Comparison, Computer, Correlation Analysis, Databases, Google Scholar, h Index, h-Index, Impact, Indicators, Journals, LIS, of-Science, Output, Publication and Citation Data Sources, Rankings, Researchers, Science, Scopus, Search, Web of Science

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Full Text: [2010\Scientometrics83, 259.pdf](2010/Scientometrics83,%20259.pdf)

Abstract: According to the definition of reliability-based citation impact factor (R-impact factor) proposed by KUO & RUPE and the cumulative citation age distribution model, a mathematical expression of the relationship between R-impact factor and impact factor is established in this paper. By simulation of the change processes of the R-impact factor and impact factor in the manipulation process of the impact factor, it is found that the effect of manipulation can be partly corrected by the R-impact factor in some cases. Based on the Journal Citation Report database, impact factors of 4 normal journals and 4 manipulated journals were collected. The journals’ R-impact factors and self-cited rates in the previous two years were calculated for each year during the period 2000 to 2007, and various characteristics influenced by the manipulation were analyzed. We find that the R-impact factor has greater fairness than the impact factor for journals with relatively short cited half-lives. Finally, some issues about using the R-impact factor as a measure for evaluating scientific journals are discussed.

Keywords: Characteristics, Citation, Citation Impact, Database, Editors, Impact, Impact Factor, Impact Factors, Journals, Manipulation, Model, Publication Delays, R-Impact Factor, Scientific Journals, Self-Cited Rate, Simulation

? Wong, P.K. and Singh, A. (2010), University patenting activities and their link to the quantity and quality of scientific publications. *Scientometrics*, **83** (1), 271-294.

Full Text: [2010\Scientometrics83, 271.pdf](2010/Scientometrics83,%20271.pdf)

Abstract: Integrating data from three independent data sources--USPTO patenting data, Shanghai Jiao Tong University’s Academic Ranking of World Universities (ARWU) and the Times Higher Education Supplement’s World University Ranking (WUR), we examine the possible link between patenting output and the quantity and quality of scientific publications among 281 leading universities world-wide. We found that patenting by these universities, as measured by patents granted by the USPTO, has grown consistently faster than overall US patenting over 1977-2000, although it has grown more slowly over the last 5 years (2000-2005). Moreover, since the mid-1990s, patenting growth has been faster among universities outside North America than among those within North America. We also found that the patenting output of the universities over 2003-2005 is significantly correlated with the quantity and quality of their scientific publications. However, significant regional variations are found: for universities in North America, both the quantity and quality of scientific publications matter, but for European and Australian/NZ universities, only the quantity of publications matter, while for other universities outside North America and Europe/Australia/NZ, only quality of publications matter. We found similar findings when using EPO patenting data instead of USPTO data. Additionally, for USPTO data only, the degree of internationalization of faculty members is found to reduce patenting performance among North American universities, but to increase that of universities outside North America. Plausible explanations for these empirical observations and implications for future research are discussed.

Keywords: Academic Research, Bayh-Dole Act, Citations, Growth, Innovation, Intellectual Property-Rights, Life Sciences, Patents, Performance, Publication Quantity & Quality, Publications, Ranking, Research, Scientific Publications, Technology Commercialization, Technology-Transfer, United-States, Universities, University, University Patenting, US, US Universities, USPTO

? Jarneving, B. (2010), Regional research and foreign collaboration. *Scientometrics*, **83** (1), 295-320.

Full Text: [2010\Scientometrics83, 295.pdf](2010/Scientometrics83,%20295.pdf)

Abstract: Motivated by the merging of four Swedish counties to a larger administrative and political unit with increased responsibilities, a comprehensive study of regional-foreign research collaboration was carried out. Various multivariate methods were applied for the depiction of collaborative networks of various compositions and at various levels of aggregation. Other aspects investigated concerned the influence of institutions and countries on regional-foreign collaboration and the relation between collaboration and research fields. Findings showed that foreign research collaboration was concentrated to three major regional institutions, each with a characteristic collaborative context. The influence of domestic collaboration was notable with regard to medical research while collaboration within the field of physics and astronomy was characteristic for pure regional-foreign collaboration, which was the dominating type of research collaboration throughout the period of observation (1998-2006).

Keywords: Authors, Collaboration, Cooperation, Medical, Methods, Networks, Publications, Region, Research, Research Collaboration, Science, Sweden

? Franzoni, C., Simpkins, C.L., Li, B.L. and Ram, A. (2010), Using content analysis to investigate the research paths chosen by scientists over time. *Scientometrics*, **83** (1), 321-335.

Full Text: [2010\Scientometrics83, 321.pdf](2010/Scientometrics83,%20321.pdf)

Abstract: We present an application of a clustering technique to a large original dataset of SCI publications which is capable at disentangling the different research lines followed by a scientist, their duration over time and the intensity of effort devoted to each of them. Information is obtained by means of software-assisted content analysis, based on the co-occurrence of words in the full abstract and title of a set of SCI publications authored by 650 American star-physicists across 17 years. We estimated that scientists in our dataset over the time span contributed on average to 16 different research lines lasting on average 3.5 years and published nearly 5 publications in each single line of research. The technique is potentially useful for scholars studying science and the research community, as well as for research agencies, to evaluate if the scientist is new to the topic and for librarians, to collect timely biographic information.

Keywords: Abstract, Academic Scientists, Clustering, Co-Occurrence, Content Analysis, Indicators, Knowledge, Knowledge Development, Performance, Productivity, Publication, Publications, Research, Research Trajectories, SCI, Science, Semantic Search, Statistics, Topic

? Linmans, A.J.M. (2010), Why with bibliometrics the Humanities does not need to be the weakest link Indicators for research evaluation based on citations, library holdings, and productivity measures. *Scientometrics*, **83** (2), 337-354.

Full Text: [2010\Scientometrics83, 337.pdf](2010/Scientometrics83,%20337.pdf)

Abstract: In this study an attempt is made to establish new bibliometric indicators for the assessment of research in the Humanities. Data from a Dutch Faculty of Humanities was used to provide the investigation a sound empirical basis. For several reasons (particularly related to coverage) the standard citation indicators, developed for the sciences, are unsatisfactory. Target expanded citation analysis and the use of oeuvre (lifetime) citation data, as well as the addition of library holdings and productivity indicators enable a more representative and fair assessment. Given the skew distribution of population data, individual rankings can best be determined based on log transformed data. For group rankings this is less urgent because of the central limit theorem. Lifetime citation data is corrected for professional age by means of exponential regression.

Keywords: Assessment, Bibliometric, Bibliometric Indicators, Bibliometrics, Citation, Citation Analysis, Citations, Coverage, Evaluation, Humanities, Indicators, Library Holding Analysis, Productivity, Professional, Rankings, Regression, Research, Research Evaluation, Social-Sciences, Sociology

? Leydesdorff, L. and Meyer, M. (2010), The decline of university patenting and the end of the Bayh-Dole effect. *Scientometrics*, **83** (2), 355-362.

Full Text: [2010\Scientometrics83, 355.pdf](2010/Scientometrics83,%20355.pdf)

Abstract: University patenting has been heralded as a symbol of changing relations between universities and their social environments. The Bayh-Dole Act of 1980 in the USA was eagerly promoted by the OECD as a recipe for the commercialization of university research, and the law was imitated by a number of national governments. However, since the 2000s university patenting in the most advanced economies has been on the decline both as a percentage and in absolute terms. In addition to possible saturation effects and institutional learning, we suggest that the institutional incentives for university patenting have disappeared with the new regime of university ranking. Patents and spin-offs are not counted in university rankings. In the new arrangements of university-industry-government relations, universities have become very responsive to changes in their relevant environments.

Keywords: Commercialization, Entrepreneurial University, Indicator, Indicators, Industry-Government, Japan, Knowledge, Legislation, Mode-2, Patents, Rankings, Research, Technology, Triple Helix, Triple-Helix, Universities, University, University Patenting, University Research, USA

? Nederhof, A.J., van Leeuwen, T.N. and van Raan, A.F.J. (2010), Highly cited non-journal publications in political science, economics and psychology: A first exploration. *Scientometrics*, **83** (2), 363-374.

Full Text: [2010\Scientometrics83, 363.pdf](2010/Scientometrics83,%20363.pdf)

Abstract: In this study we show that it is possible to identify top-cited publications other than Web of Science (WoS) publications, particularly non-journal publications, within fields in the social and behavioral sciences. We analyzed references in publications that were themselves highly cited, with at least one European address. Books represent between 62 (psychology) and 81% (political science) of the non-WoS references, journal articles 15-24%. Books (economics, political science) and manuals (psychology) account for the most highly cited publications. Between 50 (psychology, political science) and 71% (economics) of the top-ranked most cited publications originated from the US versus between 18 (economics) and 38% (psychology) from Europe. Finally, it is discussed how the methods and procedures of the study can be optimized.

Keywords: Articles, Books, Books, Citation, Citation Analysis, Economics, Europe, Highly Cited Publications, Humanities, Journal, Methods, Non-Journal Publications, Political Science, Psychology, Publications, Rankings, Science, Social And Behavioral Sciences, Sociology, US, Web of Science

? Jokic, M., Zauder, K. and Letina, S. (2010), Croatian scholarly productivity 1991-2005 measured by journals indexed in Web of Science. *Scientometrics*, **83** (2), 375-395.

Full Text: [2010\Scientometrics83, 375.pdf](2010/Scientometrics83,%20375.pdf)

Abstract: The purpose of the research was to establish and inform about the features of productivity across all scholarly fields measured through journals indexed in WoS in which Croatian authors working in Croatian institutions published since independence (1991) to 2005. Total 19,929 papers in 2,946 journals were found. Of these, 17,875 papers were published in 2,690 science, technology and medicine (STM) journals, 1,869 papers were published in 178 social science journals, and 185 were published in 78 A&H journals according to custom classification used in the research. Special attention was given to publishing features of specific scholarly fields. The number of different journals in which the papers were published per year has doubled in the period (from 404 in 1991 to 894 in 2005). To support additional insight, a distinction between national and international journals was made and top 10% journals according to JCR 2005 categories were identified by IF. National journals accounted for 15.9% of STM papers, 77.6% of social science papers and 25.9% of A&H papers. Top 10% journals accounted for a total of 368 journals and 2,336 papers with significant variations across the subfields.

Keywords: Classification, Croatia, Databases, Humanities, Information, Journal Evaluation, Journals, Medicine, Philosophy, Productivity, Publications, Publishing, Research, Research Performance, Scholarly Productivity, Science, Scientific Productivity, Social-Sciences, Stm, Technology, Web of Science, WOS

? Persson, O. (2010), Are highly cited papers more international? *Scientometrics*, **83** (2), 397-401.

Full Text: [2010\Scientometrics83, 397.pdf](2010/Scientometrics83,%20397.pdf)

Abstract: Several bibliometric studies have shown that international or multicountry papers are generally more cited than domestic or single country papers. Does this also hold for the most cited papers? In this study, the citation impact of domestic versus international papers is analyzed by comparing the share of international papers among the hundred most cited papers in four research specialities, from three universities, four cities and two countries. It is concluded that international papers are not well represented among high impact papers in research specialities, but dominate highly cited papers from small countries, and from cities and institutions within them. The share of international papers among highly cited papers is considerably higher during 2001-2008 compared to earlier years for institutions, cities and countries, but somewhat less for two of the research fields and slightly higher for the other two. Above all, domestic papers from the USA comprise about half of the highly cited papers in the research specialities.

Keywords: Bibliometric, Bibliometric Studies, Citation, Citation Impact, Co-Authorship, Highly Cited Papers, Impact, International Co-Authorships, Research, Scientific Collaboration, Universities, USA

? Yang, P.Y. and Chang, Y.C. (2010), Academic research commercialization and knowledge production and diffusion: The moderating effects of entrepreneurial commitment. *Scientometrics*, **83** (2), 403-421.

Full Text: [2010\Scientometrics83, 403.pdf](2010/Scientometrics83,%20403.pdf)

Abstract: This paper empirically examines the relationship between research commercialization, entrepreneurial commitment, and knowledge production and diffusion in academia. Through a dataset of 229 academic patent inventors, this paper reveals that the effects of research commercialization on publication quantity, application-oriented research, and disclosure delay are moderated by the entrepreneurial commitment of faculty members. This paper concludes that encouraging entrepreneurial commitment of faculty members may possibly drive academics away from their traditional approaches in producing and diffusing knowledge.

Keywords: Academic Routine, Bayh-Dole Act, Commercialization, Diffusion, Entrepreneurial Commitment, Firms, Innovation, Knowledge, Knowledge Production, Nano-Science, Non-Inventing Peers, Of-Technology, Patent, Patenting And Licensing, Patents, Property-Rights, Publication, Research, Research Commercialization, United-States, University Technology-Transfer

? Saad, G. (2010), Applying the h-index in exploring bibliometric properties of elite marketing scholars. *Scientometrics*, **83** (2), 423-433.

Full Text: [2010\Scientometrics83, 423.pdf](2010/Scientometrics83,%20423.pdf)

Abstract: The h-index is a recent metric that captures a scholar’s influence. In the current work, it is used to: (1) obtain the h-index scores of the most productive scholars in the Journal of Consumer Research (JCR), and compare these to other elite scholars (including those of the other three premier marketing journals), (2) demonstrate the relationship between the h-indices and total number of citations of the top JCR producers, (3) examine the h-indices of Ferber winners (best interdisciplinary paper based on a doctoral dissertation published in JCR in a given year) and those having received honorable mentions, (4) explore the relationship between a marketing journal’s prestige and the corresponding hindex score of its editor. These varied analyses demonstrate the multitudinous ways in which the h-index can be used when investigating bibliometric phenomena within a given discipline.

Keywords: Bibliometric, Citation Analysis, Citations, Consumer-Research, Google Scholar, H Index, H-Index, Impact, Interdisciplinary, Journals, Level, Marketing Editors, Marketing Journals, Marketing Scholars, Performance, Perspective, Reference Diversity, Research, Scientists

? Joo, S.H. and Kim, Y. (2010), Measuring relatedness between technological fields. *Scientometrics*, **83** (2), 435-454.

Full Text: [2010\Scientometrics83, 435.pdf](2010/Scientometrics83,%20435.pdf)

Abstract: Intensified technology convergence, increasing relatedness between technological fields, is a mega-trend in 21st century science and technology. However, scientometrics has been unsuccessful in identifying this techno-economic paradigm change. To address the limitations and validity problems of conventional measures of technology convergence, we introduce a multi-dimensional contingency table representation of technological field co-occurrence and a relatedness measure based on the Mantel-Haenszel common log odds ratio. We used Korean patent data to compare previous and proposed methods. Results show that the proposed method can increase understanding of the techno-economic paradigm change because it reveals significant changes in technological relatedness over time.

Keywords: Co-Classification Analysis, Co-Occurrence, Coherence, Contingency Tables, Convergence, Incomplete Multi-Dimensional Contingency Table, Indicators, IPC Co-Occurrence, Mantel-Haenszel Common Odds Ratio, Methods, Paradigm, Patent, Patent Statistics, Relatedness, Science, Science And Technology, Scientometric Transaction Matrices, Scientometrics, Technology

? Egghe, L. (2010), Characteristic scores and scales in a Lotkaian framework. *Scientometrics*, **83** (2), 455-462.

Full Text: [2010\Scientometrics83, 455.pdf](2010/Scientometrics83,%20455.pdf)

Abstract: The characteristic scores and scales (CSS), introduced by Glänzel and Schubert (J Inform Sci 14: 123-127, 1988) and further studied in subsequent papers of Glänzel, can be calculated exactly in a Lotkaian framework. We prove that these CSS are simple exponents of the average number of items per source in general IPPs. The proofs are given using size-frequency functions as well as using rank-frequency functions. We note that CSS do not necessarily have to be defined as averages but that medians can be used as well. Also for these CSS we present exact formulae in the Lotkaian framework and both types of CSS are compared. We also link these formulae with the h-index.

Keywords: Average, Characteristic Scores and Scales, CSS, h Index, h-Index, Index, Lotka, Median

? Vilibic, I. (2010), How much the shared ocean or lake basins connect the researchers in neighbouring countries? *Scientometrics*, **83** (2), 463-470.

Full Text: [2010\Scientometrics83, 463.pdf](2010/Scientometrics83,%20463.pdf)

Abstract: This paper evaluates the importance of jointly conducted research versus national, when neighbouring countries are trying to study a topic of their mutual interest. The chosen topic was the shared ocean or lake basin. The number of non-mutual and mutual articles in the period 1999-2008 for seven pairs of neighbouring countries was analysed by extracting published articles and citations from the Web of Science database. It was found that mutual articles have generally better visibility than the non-mutual articles, valid even for large and developed countries. Also, the percentage of self-citations in the mutual articles is much lower than in the non-mutual ones. However, the citations of the non-mutual articles are influenced by the development of the country or, in some cases, by the development of the countries in which researchers from a certain country are presently working (this applies strongly to the Eastern Europe countries).

Keywords: Articles, Citations, Collaborative Research, Connecting Topic, Database, Europe, Index, Neighbouring Countries, Research, Researchers, Science, Scientific Co-Authorship, Self-Citations, Topic, Visibility, Web of Science

? Wray, K.B. (2010), Rethinking the size of scientific specialties: Correcting Price’s estimate. *Scientometrics*, **83** (2), 471-476.

Full Text: [2010\Scientometrics83, 471.pdf](2010/Scientometrics83,%20471.pdf)

Abstract: I aim to advance our understanding of the size of scientific specialties. Derek Price’s groundbreaking work has provided us with valuable conceptual tools and data for making progress on this issue. But, I argue that his estimate of 100 scientists per specialty is flawed. He fails to take into account the fact that the average publishing scientist publishes only 3.5 articles throughout her career. Hence, rather than consisting of 100 scientists, I have suggested that specialties are probably somewhat larger, perhaps somewhere between 250 and 600 scientists.

Keywords: Articles, Price, Publishing, Scientific Specialty, Size, Specialization, Tools

? Zhang, G.F., Xie, S.D. and Ho, Y.S. (2010), A bibliometric analysis of world volatile organic compounds research trends. *Scientometrics*, **83** (2), 477-492.

Full Text: [2009\Scientometrics-1.pdf](2009/Scientometrics-1.pdf), [2009\Scientometrics2009-1.pdf](2009/Scientometrics2009-1.pdf), [2010\Scientometrics83, 477.pdf](2010/Scientometrics83,%20477.pdf)

Abstract: This study explores a bibliometric approach to quantitatively assessing current research trends on volatile organic compounds, by using the related literature in the Science Citation Index (SCI) database from 1992 to 2007. The articles acquired from such literature were concentrated on the general analysis by scientific output, the research performances by countries, institutes, and collaborations, and the research trends by the frequency of author keywords, words in title, words in abstract, and keywords plus. Over the past years, there had been a notable growth trend in publication outputs, along with more participation and collaboration of countries and institutes. Research collaborative papers had shifted from the national inter-institutional to the international collaboration. Benzene, toluene, and formaldehyde were the three kinds of VOCs concerned mostly. Detection and removing, especially by adsorption and oxidation, of VOCs were to be the orientation of all VOCs research in the next few years.

Keywords: Abstract, Adsorption, Articles, Author Keywords, Benzene, Bibliometric, Bibliometric Analysis, Citation, Collaboration, Database, Exposure, Frequency, Growth, Hydrocarbons, Indoor Air, International, International Collaboration, Literature, Medicine, Organic, Organic Compounds, Oxidation, Publication, Quality, Removal, Research, Research Trend, Research Trends, SCI, Science, Science Citation Index, Scientific Output, Scientometrics, Toluene, Trend, Trends, VOCs, Volatile Organic Compounds, Water

? Bornmann, L., Weymuth, C. and Daniel, H.D. (2010), A content analysis of referees’ comments: How do comments on manuscripts rejected by a high-impact journal and later published in either a low- or high-impact journal differ? *Scientometrics*, **83** (2), 493-506.

Full Text: [2010\Scientometrics83, 493.pdf](2010/Scientometrics83,%20493.pdf)

Abstract: Using the data of a comprehensive evaluation study on the peer review process of Angewandte Chemie International Edition (AC-IE), we examined in this study the way in which referees’ comments differ on manuscripts rejected at AC-IE and later published in either a low-impact journal (Tetrahedron Letters, n = 54) or a high-impact journal (Journal of the American Chemical Society, n = 42). For this purpose, a content analysis was performed of comments which led to the rejection of the manuscripts at AC-IE. For the content analysis, a classification scheme with thematic areas developed by Bornmann et al. (2008) was used. As the results of the analysis demonstrate, a large number of negative comments from referees in the areas “Relevance of contribution” and “Design/Conception” are clear signs that a manuscript rejected at AC-IE will not be published later in a high-impact journal. The number of negative statements in the areas “Writing/Presentation,” “Discussion of results,” “Method/Statistics,” and “Reference to the literature and documentation,” on the other hand, had no statistically significant influence on the probability that a rejected manuscript would later be published in a low-or high-impact journal. The results of this study have various implications for authors, journal editors and referees.

Keywords: Angewandte-Chemie, Classification, Content Analysis, Editors, Evaluation, Fate of Rejected Manuscripts, International, Journal, Journal Peer Review, Literature, Manuscripts, Peer Review, Peer-Review, Publication, Rejection, Review, Thematic Areas for Manuscript Review

? Krampen, G. (2010), Acceleration of citing behavior after the millennium? Exemplary bibliometric reference analyses for psychology journals. *Scientometrics*, **83** (2), 507-513.

Full Text: [2010\Scientometrics83, 507.pdf](2010/Scientometrics83,%20507.pdf)

Abstract: With reference to social constructivist approaches on citing behavior in the sciences, the hypothesis of acceleration of citing behavior after the millennium was empirically tested for a stratified random sample of exemplary psychology journal articles. The sample consists of 45 English and 45 German articles published in the years 1985 versus 1995 versus 2005 in high impact journals on developmental psychology, psychological diagnosis and assessment, and social psychology. Content analyses of the reference lists refer to the total number of references cited in the articles and the publication years of all references. In addition, the number of self-references, the number of pages, and the number of authors were determined for each article. Results show that there is no acceleration of citing behavior, rather, on the contrary, a significant trend is revealed for an increase in authors’ citing somewhat older references in the newer journal articles. Significant main effects point also at more citations of somewhat older references in the English (vs. German) journal articles as well as in articles on social psychology and psychological diagnosis (vs. on developmental psychology). Complementary analyses show that multiple authorships and the number of pages as well as the total number of references and the number of self-references increase significantly with time. However, percentage of self-references remains quite stable at about 10%. Some methodological and statistical traps in bibliometric testing the starting hypothesis are considered. Thus, the talk that has been circulating among psychology colleagues and students on the potential millennium effects on citing behavior in the sciences (which can, however, become a self-fulfilling prophecy) are not confirmed-at least for psychology journals.

Keywords: Articles, Assessment, Bibliometric, Bibliometrics, Citation, Citations, Citing Behavior, Content Analysis, Diagnosis, Impact, Journal, Journals, Literature References, Millennium, Psychology, Publication, Science, Scientometry, Self-Fulfilling Prophecy, Sociology

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Full Text: [2010\Scientometrics83, 515.pdf](2010/Scientometrics83,%20515.pdf)

Abstract: In this paper, we examine whether the quality of academic research can be accurately captured by a single aggregated measure such as a ranking. With Shanghai University’s Academic Ranking of World Universities as the basis for our study, we use robust principal component analysis to uncover the underlying factors measured by this ranking. Based on a sample containing the top 150 ranked universities, we find evidence that, for the majority of these institutions, the Shanghai rankings reflect not one but in fact two different and uncorrelated aspects of academic research: overall research output and top-notch researchers. Consequently, the relative weight placed upon these two factors determines to a large extent the final ranking.

Keywords: PCA, Ranking, Rankings, Research, Research Output, Researchers, RMCD, Robustness, Shanghai, Universities, University

? Upham, S.P., Rosenkopf, L. and Ungar, L.H. (2010), Innovating knowledge communities: An analysis of group collaboration and competition in science and technology. *Scientometrics*, **83** (2), 525-554.

Full Text: [2010\Scientometrics83, 525.pdf](2010/Scientometrics83,%20525.pdf)

Abstract: A useful level of analysis for the study of innovation may be what we call “knowledge communities”-intellectually cohesive, organic inter-organizational forms. Formal organizations like firms are excellent at promoting cooperation, but knowledge communities are superior at fostering collaboration-the most important process in innovation. Rather than focusing on what encourages performance in formal organizations, we study what characteristics encourage aggregate superior performance in informal knowledge communities in computer science. Specifically, we explore the way knowledge communities both draw on past knowledge, as seen in citations, and use rhetoric, as found in writing, to seek a basis for differential success. We find that when using knowledge successful knowledge communities draw from a broad range of sources and are extremely flexible in changing and adapting. In marked contrast, when using rhetoric successful knowledge communities tend to use very similar vocabularies and language that does not move or adapt over time and is not unique or esoteric compared to the vocabulary of other communities. A better understanding of how inter-organizational collaborative network structures encourage innovation is important to understanding what drives innovation and how to promote it.

Keywords: Biotechnology, Characteristics, Citation Patterns, Citations, Collaboration, Combined Cocitation, Competition, Computer, Construction, Dynamic Clustering, Innovation, Isomorphism, Knowledge, Knowledge Communities, Market Orientation, Networks, Resource-Based View, Science, Science and Technology, Search, Technology, Word Analysis

? Upham, S.P., Rosenkopf, L. and Ungar, L.H. (2010), Positioning knowledge: Schools of thought and new knowledge creation. *Scientometrics*, **83** (2), 555-581.

Full Text: [2010\Scientometrics83, 555.pdf](2010/Scientometrics83,%20555.pdf)

Abstract: Cohesive intellectual communities called “schools of thought” can provide powerful benefits to those developing new knowledge, but can also constrain them. We examine how developers of new knowledge position themselves within and between schools of thought, and how this affects their impact. Looking at the micro and macro fields of management publications from 1956 to 2002 with an extensive dataset of 113,000+ articles from 41 top journals, we explore the dynamics of knowledge positioning for management scholars. We find that it is significantly beneficial for new knowledge to be a part of a school of thought, and that within a school of thought new knowledge has more impact if it is in the intellectual semi-periphery of the school.

Keywords: Articles, Citation Patterns, Clustering, Cocitation Analysis, Exploration, History, Impact, Innovation, Intellectual Structure, Journals, Knowledge, Management, Management Journals, Old, Publications, Schools of Thought, Science, Search, Specialties

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Full Text: [2010\Scientometrics83, 583.pdf](2010/Scientometrics83,%20583.pdf)

Abstract: In 538 randomly selected Swedish biomedical PhDs from 2008, 50% of the external examiners came from abroad, most commonly USA and UK. The sex distribution between candidates was equal, while 17% of the external examiners were women. Twice as many women candidates as men had women examiners. Swedish PhDs are based on work published in international peer-reviewed journals, the median number of works per thesis was 4. The Swedish thesis examination system offers a model for international cross-fertilisation.

Keywords: Common Doctorate, Cross-Border Collaboration, Electronic Theses Dissertations (ETD), Europe, International Thesis Line, Internationalisation of Science, Journals, Model, Scientific Communication, System, Thesis, UK, USA

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Full Text: [2010\Scientometrics83, 589.pdf](2010/Scientometrics83,%20589.pdf)

Abstract: Journals covered by the 2006 Science Citation Index Journal Citation Reports database have been subjected to a clustering procedure utilizing h-similarity as the underlying similarity measure. Clustering complemented with a prototyping routine provided well-conceivable results that are both compatible with and further refine existing taxonomies of science.

Keywords: Citation, Clustering, Community Structure, Database, h-Index, h-Similarity, Journal Citation Reports, Journals, Mapping, Mapping of Science, Networks, Science, Science Citation Index, Taxonomies

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Full Text: [2010\Scientometrics83, 601.pdf](2010/Scientometrics83,%20601.pdf)

Keywords: Scientometrics

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Full Text: [2010\Scientometrics83, 603.pdf](2010/Scientometrics83,%20603.pdf)

Keywords: Informetrics, International, Scientometrics

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Full Text: [2010\Scientometrics83, 605.pdf](2010/Scientometrics83,%20605.pdf)

Abstract: The involvement of male and female scientists in the technological activity developed in Spain is analysed through the study of patent applications filed with the Spanish OEPM database during the period 1990-2005. Comparative analyses based on participation, contribution and inventors by gender are presented and discussed. The study reveals a low female involvement in technology, which tends to concentrate in specific institutional sectors (public research institutions) and technological sections (A/Human Necessities and C/Chemistry). Over the 16-year period analysed the involvement of female scientists rose at a higher rate than that of men in most of the institutional sectors and technological fields. The highest relative increase corresponds to University and Spanish National Research Council, and our data suggest that it is enhanced by collaboration. To make the production of sex-disaggregated technology indicators easier the inclusion of the sex of the inventors as an additional field in patent databases would be desirable, as well as a higher normalisation of inventor names, applicant names (full names) and institutional affiliations.

Keywords: Academia, Applications, Collaboration, Contribution, Database, Databases, Gender, Gender, Indicators, Inventors, Patent, Patenting Activity, Public Research, Research, Research Institutions, Science, Spain, Spanish, Technological Activity, Technology, University

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Full Text: [2010\Scientometrics83, 623.pdf](2010/Scientometrics83,%20623.pdf)

Abstract: The investigators studied author research impact using the number of citers per publication an author’s research has been able to attract, as opposed to the more traditional measure of citations. A focus on citers provides a complementary measure of an author’s reach or influence in a field, whereas citations, although possibly numerous, may not reflect this reach, particularly if many citations are received from a small number of citers. In this exploratory study, Web of Science was used to tally citer and citation-based counts for 25 highly cited researchers in information studies in the United States and 26 highly cited researchers from the United Kingdom. Outcomes of the tallies based on several measures, including an introduced ch-index, were used to determine whether differences arise in author rankings when using citer-based versus citation-based counts. The findings indicate a strong correlation between some citation and citer-based measures, but not with others. The findings of the study have implications for the way authors’ research impact may be assessed.

Keywords: Authors, Citation, Citation Analysis, Citation Analysis, Citations, Citer Analysis, Correlation, h-Index, Ideas, Impact, Information Science, Information Studies, Publication, Publications, Rankings, Research, Research Impact, Researchers, Science, United Kingdom, United States, Web of Science

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Full Text: [2010\Scientometrics83, 639.pdf](2010/Scientometrics83,%20639.pdf)

Abstract: This research intends to investigate the patent activity on water pollution and treatment in China (1985-2007), and then compares the results with patents data about Triadic patents, South Korea, Brazil and India over the same periods, patents data were collected from Derwent World Patents Index between 1985 and May 2008. For this study, 169,312 patents were chosen and examined. Total volume of patents, technology focus, assignee sector, priority date and the comparison with other countries are analyzed. It is found that patents on water pollution and treatment filed at China have experienced a remarkable increase and the increase rate of patents filed at China change simultaneous with the percentage of domestic applications. However, the number of high quality Triadic patents with priority country as China remains small. Furthermore, in addition to individual patent assignees, both Chinese universities and enterprises also play important roles in patent activity of water pollution and treatment. In addition, the pattern of South Korea’s development can provide short-term implications for China and the regularity in Triadic patents’ development can provide some guidance to China’s long-term development. In contrast, the development pattern of Brazil and India is less influential to China’s development. Furthermore, China’s technology focuses on water pollution and treatment seem to parallel global and triadic patent trends. This research provides a comprehensive picture of China’s innovation capability in the area of water pollution and treatment. It will help China’s local governments to improve their regional S&T capability and will provide support the National Water Pollution Control and Treatment Project in China.

Keywords: Applications, Asia, Change, China, Comparison, Development, Development Efficiency, DWPI Database, Genetic-Engineering Research, Global, India, Indicators, Industry, Information, Innovation, Korea, Local, Patent, Patent Analysis, Patents, Play, Pollution, Research, Scientometrics, Statistics, Taiwan, Technologies, Technology, Treatment, Trends, Triadic Patents, Universities, Water, Water Pollution and Treatment in China

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Full Text: [2010\Scientometrics83, 653.pdf](2010/Scientometrics83,%20653.pdf)

Abstract: A central idea in Dan Sperber and Deirdre Wilson’s relevance theory is that an individual’s sense of the relevance of an input varies directly with the cognitive effects, and inversely with the processing effort, of the input in a context. I argue that this idea has an objective analog in information science-the tf\*idf (term frequency, inverse document frequency) formula used to weight indexing terms in document retrieval. Here, tf\*idf is used to weight terms from five bibliometric distributions in the context of the seed terms that generated them. The distributions include the descriptors co-assigned with a descriptor, the descriptors and identifiers assigned to an author, two examples of cited authors and their co-citees, and the books and journals cited with a famous book, The Structure of Scientific Revolutions. In each case, the highest-ranked terms are contrasted with lowest-ranked terms. In two cases, pennant diagrams, a new way of displaying bibliometric data, augment the tabular results. Clear qualitative differences between the sets of terms are intuitively well-explained by relevance theory.

Keywords: Bibliometric, Bibliometric Data, Bibliometrics, Books, Combining Bibliometrics, Information Science, Journals, Pennant Diagrams, Processing, Relevance Theory, Retrieval, Science, Tf\*Idf, Theory

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Full Text: [2010\Scientometrics83, 669.pdf](2010/Scientometrics83,%20669.pdf)

Abstract: We introduce a new visual analytic approach to the study of scientific discoveries and knowledge diffusion. Our approach enhances contemporary co-citation network analysis by enabling analysts to identify co-citation clusters of cited references intuitively, synthesize thematic contexts in which these clusters are cited, and trace how research focus evolves over time. The new approach integrates and streamlines a few previously isolated techniques such as spectral clustering and feature selection algorithms. The integrative procedure is expected to empower and strengthen analytical and sense making capabilities of scientists, learners, and researchers to understand the dynamics of the evolution of scientific domains in a wide range of scientific fields, science studies, and science policy evaluation and planning. We demonstrate the potential of our approach through a visual analysis of the evolution of astronomical research associated with the Sloan Digital Sky Survey (SDSS) using bibliographic data between 1994 and 2008. In addition, we also demonstrate that the approach can be consistently applied to a set of heterogeneous data sources such as e-prints on arXiv, publications on ADS, and NSF awards related to the same topic of SDSS.

Keywords: AD, ADS, Clustering, Co-Citation, Co-Citation Network Analysis, Cocitation, Diffusion, Evaluation, Evolution, Knowledge, Network Analysis, Networks, Policy Evaluation, Publications, Research, Researchers, Science, Science Policy, SDSS, Selection, Techniques, Topic, Visual Analytics, Visualization

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Full Text: [2010\Scientometrics83, 689.pdf](2010/Scientometrics83,%20689.pdf)

Abstract: The uncitedness factor of a journal is its fraction of uncited articles. Given a set of journals (e.g. in a field) we can determine the rank-order distribution of these uncitedness factors. Hereby we use the Central Limit Theorem which is valid for uncitedness factors since it are fractions, hence averages. A similar result was proved earlier for the impact factors of a set of journals. Here we combine the two rank-order distributions, hereby eliminating the rank, yielding the functional relation between the impact factor and the uncitedness factor. It is proved that the decreasing relation has an S-shape: first convex, then concave and that the inflection point is in the point (mu’, mu) where mu is the average of the impact factors and mu’ is the average of the uncitedness factors.

Keywords: Articles, Central Limit Theorem, Impact, Impact Factor, Impact Factors, Journal, Journals, Rank Distribution, Rank-Order Distribution, S-Shape, Uncitedness Factor

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Full Text: [2010\Scientometrics83, 697.pdf](2010/Scientometrics83,%20697.pdf)

Abstract: The tail properties of scientometric distributions are studied in the light of the h-index and the characteristic scores and scales. A statistical test for the h-core is presented and illustrated using the example of four selected authors. Finally, the mathematical relationship between the h-index and characteristic scores and scales is analysed. The results give new insights into important properties of rank-frequency and extreme-value statistics derived from scientometric and informetric processes.

Keywords: Characteristic Scores and Scales, Citation Impact, h Index, h-Index, Indicators, Journals, Lomax Distribution, Ordered Statistics, Paretian Distribution, Renyi Presentation, Statistics

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Full Text: [2010\Scientometrics83, 711.pdf](2010/Scientometrics83,%20711.pdf)

Abstract: Applications of non-parametric frontier production methods such as Data Envelopment Analysis (DEA) have gained popularity and recognition in scientometrics. DEA seems to be a useful method to assess the efficiency of research units in different fields and disciplines. However, DEA results give only a synthetic measurement that does not expose the multiple relationships between scientific production variables by discipline. Although some papers mention the need for studies by discipline, they do not show how to take those differences into account in the analysis. Some studies tend to homogenize the behaviour of different practice communities. In this paper we propose a framework to make inferences about DEA efficiencies, recognizing the underlying relationships between production variables and efficiency by discipline, using Bayesian Network (BN) analysis. Two different DEA extensions are applied to calculate the efficiency of research groups: one called CCRO and the other Cross Efficiency (CE). A BN model is proposed as a method to analyze the results obtained from DEA. BNs allow us to recognize peculiarities of each discipline in terms of scientific production and the efficiency frontier. Besides, BNs provide the possibility for a manager to propose what-if scenarios based on the relations found.

Keywords: Bayesian Networks, Data Envelopment Analysis, DEA, Efficiency, Efficiency Measurement, Groups, Impact, Indicators, Measurement, Methods, Model, Networks, Performance, Research, Research Groups, Research-And-Development, Scientific Production, Scientometrics

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Full Text: [2010\Scientometrics83, 723.pdf](2010/Scientometrics83,%20723.pdf)

Abstract: Cuban scientific output at macro level has not been frequently studied in the literature on scientometrics. The current paper explores the different metric approaches to the Cuban scientific activity carried out by national and international authors. Also, the article develops a scientometric study of the Cuban scientific production as included in Scopus during the period 1996-2007, using socio-economic indicators combined with bibliometric indicators supported by the SCImago Journal & Country Rank. Web of Science and Scopus are compared as information sources. Results confirm the possibility to use Scopus to obtain an objective picture of the Cuban science behaviour during the end of the 1990s and the beginning of the XXI century. The SCImago Journal & Country Rank, in this case, offers an important set of indicators. The combination of these indicators with those related to socio-economic aspects of activities in Science and Technology, allow the authors to show a perspective of the Cuban science system evolution during the period analyzed. The inclusion in Scopus of less-cited journals published in Spanish language and its impact on productivity and citation-based indicators is also discussed. Our investigation found an increasing growth of the Cuban scientific production during the whole period, which is in correspondence to the country efforts and expenditures in Research and Development activities.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Countries, Cuba, Databases, Development, Evolution, GDP, Growth, Impact, Indicators, International, Journals, Language, Literature, Productivity, Research, Science, Scientific Output, Scientific Production, Scientometrics, Scimago, Scopus, Socio-Economic Indicators, Spanish, System, Technology, Web of Science

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Full Text: [2010\Scientometrics83, 739.pdf](2010/Scientometrics83,%20739.pdf)

Abstract: We consider the “Matthew effect” in the citation process which leads to reallocation (or misallocation) of the citations received by scientific papers within the same journals. The case when such reallocation correlates with a country where an author works is investigated. Russian papers in chemistry and physics published abroad were examined. We found that in both disciplines in about 60% of journals Russian papers are cited less than average ones. However, if we consider each discipline as a whole, citedness of a Russian paper in physics will be on the average level, while chemistry publications receive about 16% citations less than one may expect from the citedness of the journals where they appear. Moreover, Russian chemistry papers mostly become undercited in the leading journals of the field. Characteristics of a “Matthew index” indicator and its significance for scientometric studies are also discussed.

Keywords: Chemistry, Citation, Citations, Citedness, Competition, Core Journals, Correlates, Countries, Impact, Indicators, International Comparison, Journals, Matthew Index, Physics, Publications, Science

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Full Text: [2010\Scientometrics83, 751.pdf](2010/Scientometrics83,%20751.pdf)

Abstract: This study uses author co-citation analysis to trace prospectively the development of the cognitive neuroscience of attention between 1980 and 2005 from its precursor disciplines: cognitive psychology, single cell neurophysiology, neuropsychology, and evoked potential research. The author set consists of 28 authors highly active in attentional research in the mid-1980s. PFNETS are used to present the co-citation networks. Authors are clustered via the single-link clustering intrinsic to the PFNET algorithm. By 1990 a distinct cognitive neuroscience specialty cluster emerges, dominated by authors engaged in brain imaging research.

Keywords: Attention, Author Co-Citation Analysis, Author Cocitation Analysis, Authors, Brain, Brain Imaging, Cluster, Clustering, Co-Citation, Co-Citation Analysis, Cocitation Analysis, Cognitive Neuroscience, Development, Knowledge Domains, Networks, Neuropsychology, Neuroscience, PFNET, Research

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Full Text: [2010\Scientometrics83, 765.pdf](2010/Scientometrics83,%20765.pdf)

Abstract: Scientific progress in technology oriented research fields is made by incremental or fundamental inventions concerning natural science effects, materials, methods, tools and applications. Therefore our approach focuses on research activities of such technological elements on the basis of keywords in published articles. In this paper we show how emerging topics in the field of optoelectronic devices based on scientific literature data from the PASCAL-database can be identified. We use Results from PROMTECH project, whose principal objective was to produce a methodology allowing the identification of promising emerging technologies. In this project, the study of the intersection of Applied Sciences as well as Life (Biological & Medical) Sciences domains and Physics with bibliometric methods produced 45 candidate technological fields and the validation by expert panels led to a final selection of 10 most promising ones. These 45 technologies were used as reference fields. In order to detect the emerging research, we combine two methodological approaches. The first one introduces a new modelling of field terminology evolution based on bibliometric indicators: the diffusion model and the second one is a diachronic cluster analysis. With the diffusion model we identified single keywords that represent a high dynamic of the mentioned technology elements. The cluster analysis was used to recombine articles, where the identified keywords were used to technological topics in the field of optoelectronic devices. This methodology allows us to answer the following questions: Which technological aspects within our considered field can be detected? Which of them are already established and which of them are new? How are the topics linked to each other?

Keywords: Applications, Articles, Bibliometric, Bibliometric Indicators, Cluster, Cluster Analysis, Diachronic Cluster Analysis, Diffusion, Diffusion Model, Diffusion Stages, Emerging Research Issues, Emerging Technologies, Emerging Technologies, Evolution, Evolution of a Technological Field, Identification, Indicators, Literature, Methodology, Methods, Migration of Terms, Model, Modelling, Optoelectronic Devices, Physics, Research, Research Issues, Science, Science Dynamics, Scientific Literature, Selection, Technology, Tools, Topics, Tracking, Validation

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Full Text: [2010\Scientometrics83, 783.pdf](2010/Scientometrics83,%20783.pdf)

Abstract: Citation network analysis is an effective tool to analyze the structure of scientific research. Clustering is often used to visualize scientific domain and to detect emerging research front there. While we often set arbitrarily clustering threshold, there is few guide to set appropriate threshold. This study analyzed basic process how clustering of citation network proceeds by tracking size and modularity change during clustering. We found that there are three stages in clustering of citation networks and it is universal across our case studies. In the first stage, core clusters in the domain are formed. In the second stage, peripheral clusters are formed, while core clusters continue to grow. In the third stage, core clusters grow again. We found the minimum corpus size around one hundred assuring the clustering. When the corpus size is less than one hundred, clustered network structure tends to be more random. In addition even for the corpus whose size is larger than it, the clustering quality for some clusters formed in the later stage is low. These results give a fundamental guidance to the user of citation network analysis.

Keywords: Bibliometrics, Case Studies, Change, Citation, Citation Network, Citation Network Analysis, Clustering, Clustering Quality, Core, Domain Visualization, Growth, Modularity, Network Analysis, Networks, Research, Research Front, Science, Scientific Research

? Tonta, Y. and Unal, Y. (2010), Does Urquhart’s Law hold for consortial use of electronic journals? *Scientometrics*, **83** (3), 793-808.

Full Text: [2010\Scientometrics83, 793.pdf](2010/Scientometrics83,%20793.pdf)

Abstract: This paper tests the validity of Urquhart’s Law (“the inter-library loan demand for a periodical is as a rule a measure of its total use”). It compares the use of print journals at the Turkish Academic Network and Information Center (ULAKBIM) with the consortial use of the same journals in their electronic form by the individual libraries making up the Consortium of Turkish University Libraries (ANKOS). It also compares the on-site use of electronic journals at ULAKBIM with their consortial use at ANKOS. About 700 thousand document delivery, in-house and on-site use data and close to 28 million consortial use data representing seven years’ worth of downloads of full-text journal articles were used. Findings validate Urquhart’s Law in that a positive correlation was observed between the use of print journals at ULAKBIM and the consortial use of their electronic copies at ANKOS. The on-site and consortial use of electronic journals was also highly correlated. Both print and electronic journals that were used most often at ULAKBIM tend to get used heavily by the member libraries of ANKOS consortium, too. Findings can be used in developing consortial collection management policies and negotiate better consortial licence agreements.

Keywords: Articles, Collections, Consortial Use, Correlation, Document Delivery, E-Journals, Electronic Journals, Formulation, Impact, Interlibrary Use, Intralibrary Use, Journal, Journals, Library, Log Analysis, Management, Periodical, Positive, Probability, Science, Serials, Supralibrary Use, University, Urquhart’s Law, Validity

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Full Text: [2010\Scientometrics83, 809.pdf](2010/Scientometrics83,%20809.pdf)

Abstract: In September 2008 Thomson Reuters added to the ISI Web of Science (WOS) the Conference Proceedings Citation Indexes for Science and for the Social Sciences and Humanities. This paper examines how this change affects the publication and citation counts of highly cited computer scientists. Computer science is a field where proceedings are a major publication venue. The results show that most of the highly cited publications of the sampled researchers are journal publications, but these highly cited items receive more than 40% of their citations from proceedings papers. The paper also discusses issues related to double-counting, i.e., when a given work is published both in a proceedings and later on as a journal paper.

Keywords: Change, Citation, Citation Counts, Citations, Computer, Computer Science, Conference Proceedings Citation Indexes, h-Index, Humanities, ISI, ISI Web, ISI Web Of Science, Journal, Publication, Publication Counts, Publications, Re-Publishing, Researchers, Scholarly Communication, Science, Thomson Reuters, Web of Science

? Hayashi, M.C.P.I., Rothberg, D. and Hayashi, C.R.M. (2010), Scientific knowledge and digital democracy in Brazil: how to assess public health policy debate with applied Scientometrics. *Scientometrics*, **83** (3), 825-833.

Full Text: [2010\Scientometrics83, 825.pdf](2010/Scientometrics83,%20825.pdf)

Abstract: We proposed an original research design based on applied Scientometrics and frame analysis to assess how a citation was made to sustain arguments in documents on public health policies subjected to online public consultation from 2003 to 2008 in Brazil. So we built on citation studies to create a new scale to estimate why a scientific work was mentioned in our sample of 278 citations. We found that government branches make citations mainly to value their arguments, not to explain them, and that contributors mainly make citations in such a way that could discourage others from engaging in digital democracy.

Keywords: Applied Scientometrics, Citation, Citation Studies, Citations, Deliberation, Digital Democracy, Health, Knowledge, Opinion, Public Health, Research, Scale, Scientometrics

? Small, H. (2010), Maps of science as interdisciplinary discourse: Co-citation contexts and the role of analogy. *Scientometrics*, **83** (3), 835-849.

Full Text: [2010\Scientometrics83, 835.pdf](2010/Scientometrics83,%20835.pdf)

Abstract: Interdisciplinarity can be manifest in many forms: through collaboration or communication between scientists working in different fields or through the work of individual scientists who employ concepts or methods across disciplines. This latter form of interdisciplinarity is addressed here with the goal of understanding how ideas in different fields come together to create new opportunities for discovery. Maps of science are used to suggest possible interdisciplinary links which are then analyzed by co-citation context analysis. Interdisciplinary links are identified by juxtaposing a clustering and mapping of documents against a journal-based categorization of the same document clusters. Links between clusters are characterized as interdisciplinary based on the dissonance of their category assignments. To verify and probe more deeply into the meaning of interdisciplinary links, co-citation contexts for selected links from five separate cases are analyzed in terms of prominent cue words. This analysis reveals that interdisciplinary connections are often based on authors’ perceptions of analogous problems across scientific domains. Cue words drawn from the citation contexts also suggest that these connections are viewed as important and ripe with both opportunity and risk.

Keywords: Analogy, Citation, Clustering, Clusters, Co-Citation, Co-Citation Contexts, Collaboration, Communication, Cue Word Analysis, Discourse, Discovery, Interdisciplinarity, Interdisciplinary, Interdisciplinary Links, Mapping, Maps of Science, Methods, Risk, Science, Simulation

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Full Text: [2010\Scientometrics83, 851.pdf](2010/Scientometrics83,%20851.pdf)

Abstract: It is known that there are significant correlations between linking and geographical patterns. Although interlinking patterns have been studied in various contexts, co-inlinking patterns on the Web have only been studied as indicator of business competitive positions. This research studies the use of co-inlinks to local government Web sites, assesses whether co-inlinking follows geographic patterns and investigates reasons for creating the co-inlinks. Strong evidence was found that co-inlinking is more frequent to municipalities in the same functional region than to municipalities in different functional regions, indicating that this geographic aspect influences co-inlinking, even though geographic co-inlinking was not a strong trend overall. Because the functional regions are created based on cooperation between the municipalities, we have indirectly been able to map cooperation from co-inlinking patterns on the Web. The main reason to create co-inlinking links to municipalities was that the source of the links wanted to show a connection to its region.

Keywords: Co-Inlinking, Colinks, Content Analysis, Framework, Geography, Hyperlinks, Information, Link Analysis, Link Creation, Local, Local Government, Motivations, Research, Site Interlinking, Universities, Webometrics

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Full Text: [2010\Scientometrics83, 863.pdf](2010/Scientometrics83,%20863.pdf)

Abstract: The enormous increase in digital scholarly data and computing power combined with recent advances in text mining, linguistics, network science, and scientometrics make it possible to scientifically study the structure and evolution of science on a large scale. This paper discusses the challenges of this ‘BIG science of science’aEuro”also called ‘computational scientometrics’ research-in terms of data access, algorithm scalability, repeatability, as well as result communication and interpretation. It then introduces two infrastructures: (1) the Scholarly Database (SDB) (http://sdb.slis.indiana.edu), which provides free online access to 22 million scholarly records-papers, patents, and funding awards which can be cross-searched and downloaded as dumps, and (2) Scientometrics-relevant plug-ins of the open-source Network Workbench (NWB) Tool (http://nwb.slis.indiana.edu). The utility of these infrastructures is then exemplarily demonstrated in three studies: a comparison of the funding portfolios and co-investigator networks of different universities, an examination of paper-citation and co-author networks of major network science researchers, and an analysis of topic bursts in streams of text. The article concludes with a discussion of related work that aims to provide practically useful and theoretically grounded cyberinfrastructure in support of computational scientometrics research, education and practice.

Keywords: Algorithm Scalability, Co-Author, Communication, Comparison, Computational Scientometrics, Cyberinfrastructure, Data Access, Database, Education, Evolution, Evolution of Science, Funding, Interpretation, Linguistics, Network Workbench, Networks, Open Access, Open Source, Patents, Related Tools, Research, Researchers, Scale, Scholarly Database, Science, Science of Science, Scientometrics, Text Mining, Text-Mining, Topic, Universities

? Yang, S.L., Qiu, J.P. and Xiong, Z.Y. (2010), An empirical study on the utilization of web academic resources in humanities and social sciences based on web citations. *Scientometrics*, **84** (1), 1-19.

Full Text: [2010\Scientometrics84, 1.pdf](2010/Scientometrics84,%201.pdf)

Abstract: In this era of a rapid change in the way people finding and using information resources, despite that the academic communication and using patterns for people in the traditional print environment have been studied for many years, the Internet media presents a new and relatively unexplored area for such study. In this article, we explored the distribution and utilization of web recourses in humanities and social sciences based on web citations. We collected 1,421,731 citations listed in 148,172 articles from 493 journals published during the period of 2006-2007 in the CSSCI, which resulted in 44,973 web citations. We counted the amount and types of web resources used in various disciplines, analyzed the URLs frequency from the host-level, fitted the frequency distribution into the regression models with SPSS, and perform the disciplines coupling analysis based on the web citations. We found out that: (a) The distributions of web citations by years or by websites and webpage types are selective and regular, (b) Great disparity exists among various disciplines in terms of using web information, and the high-frequency websites, (c) The frequency distribution of web citations is similar to the Garfield’s citation distribution curve, (d) Some relationships between disciplines are detected, based on the utilization of web information.

Keywords: Accessibility, Articles, Change, Citation, Citations, Communication, Cssci, Distribution, Electronic Resources, Environment, Humanities, Humanities And Social Sciences, Information-Science, Internet, Internet References, Journals, Models, Persistence, Regression, Social Sciences, Stability, Web Citation, Web Recourses, Web Reference

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Full Text: [2010\Scientometrics84, 21.pdf](2010/Scientometrics84,%2021.pdf)

Abstract: Research astronomers and the telescopes they use each have typical life spans of about 40 years. Most of their journals live a good deal longer, though the second most important one today is only 40 years old. This paper looks at numbers for productivity and impact of specific astronomical facilities, changes in equality of opportunities and achievements in observational astronomy, and some aspects of national contributions. The focus is on optical astronomy, though something is also said about radio telescopes and astronomy from space. In summary, nothing stays “best of class” for very long, the fraction of the community with access to the most valuable facilities has increased with time (more equality of opportunity), but the fraction of citations earned by the few super-star papers has also increased (less equality of achievement), and the USA remains the host of the most-cited journals and the most productive telescopes, though Europe (meaning in this context the member nations of the European Southern Observatory, the European Space Agency, and the supporters of the journal Astronomy & Astrophysics) are fast closing the gap, with the UK retaining its own journal and some observing facilities not shared with either the USA or other European countries. Detailed examination of specific facilities indicates that size (of telescope, community, and budget) are all of great importance, but that the most significant “focal plane instrument” is still the astronomer at the virtual eyepiece. The changes have happened against a background of enormous increases in numbers of astronomers, sizes of available facilities (but not total number), numbers of papers (but not of journals), and numbers of citations per paper. A significant subset of the conclusions on turnover of people and facilities accompanying major growth: opportunity versus achievement, Europe versus the USA, and the trade-off between community size and the influence of individual scientists undoubtedly apply in many other fields.

Keywords: Astrophysics, Background, Budget, Citation Impact, Citations, Europe, Growth, Impact, Journal, Journals, Observational Astronomy, Optical Telescopes, Productivity, Publication Productivity, Publications, Research, Telescope, UK, USA

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Full Text: [2010\Scientometrics84, 35.pdf](2010/Scientometrics84,%2035.pdf)

Abstract: I studied the distribution of changes in journal impact factors (JIF) between 1998 and 2007 according to an empirical beta law with two exponents. Changes in JIFs (CJIF) were calculated as the quotient obtained by dividing the JIF for a given year by the JIF for the preceding year. The CJIFs showed good fit to a beta function with two exponents. In addition, I studied the distribution of the changes in segments of the CJIF rank order. The distributions, which were similar from year to year, could be fitted to a Lorentzian function. The methods used here can be useful to understand the changes in JIFs using relatively simple functions.

Keywords: Citations, Distribution, Distribution of Changes In Impact Factors, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journals, Methods

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Full Text: [2010\Scientometrics84, 43.pdf](2010/Scientometrics84,%2043.pdf)

Abstract: We introduce the dominance dimension principle and the parameterized family of criteria for the assessment of publication/citation profiles it generates. We show that by a suitable choice of parameters dominance dimension may specialize to the most widely known and used of those impact scores for the scientific output of authors which disallow endogenous reputation effects, including the Durfee- or h-number, the publication number and the citation number.

Keywords: Assessment, Citation, Criteria, Effects, H-Index, Hirsch-Index, Impact, Integer-Valued Scores, Output, Parameters, Primitive Recursive Functions, Publication, Scientific Impact, Scientific Impact Indices, Scientific Output

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Full Text: [2010\Scientometrics84, 49.pdf](2010/Scientometrics84,%2049.pdf)

Abstract: The present paper describes the application of growth models as suggested by Egghe and Ravichadra Rao (Scientometrics 25:5-46, 1992). The scope of the paper is limited to study the growth and dynamics of Indian and Chinese publications in the field of liquid crystals research (1997-2006).

Keywords: Citation, Dynamics, Growth, Liquid Crystals, Literature, Modeling, Modeling The Growth, Models, Publications, Research, Science, Science Citation Index, Scientometrics

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Full Text: [2010\Scientometrics84, 53.pdf](2010/Scientometrics84,%2053.pdf)

Abstract: Patenting and licensing is not only a significant method of university knowledge transfer, but also an important indicator for measuring academic R&D strength and knowledge utilization. The methodologies of quantitative and qualitative analysis, including a special patent h-index indicator to assess patenting quality, were used to examine university patenting worldwide. Analysis of university patenting from 1998 to 2008 showed a significant overall global increase in which Chinese academia stands out: most of the top 20 universities in patenting in 2008 were in China. However, a low rate of utilization of Chinese academic patents may have roots in: (1) university research evaluation system encourages the patent production more, rather than the utilization, (2) problems in the formal mechanisms for university technology transfer and licensing, (3) industry’s limited expectation and receptive capabilities and/or (4) a mismatch between the interests of the two institutional spheres. The next action to be taken by government, university and industry in China will be to explore strategies for improving academic patent quality and industry take-up.

Keywords: Academic Patent Industrialization, Bayh-Dole Act, China, Evaluation, Global, h Index, h-Index, Index, Industry, Knowledge, Mechanisms, Patent, Patent Quality Strategy, Patenting and Licensing, Patentometric, Patents, Production, Quality, Quantitative, R&D, Research, Research Evaluation, Roots, System, Technology, Technology Transfer, Universities, University, University Patenting, University Research, University Technology Transfer

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Full Text: [2010\Scientometrics84, 65.pdf](2010/Scientometrics84,%2065.pdf)

Abstract: Using strictly the same parameters (identical two publication years (2004 2005) and identical one-year citation window (2006)), IF 2006 was compared with h-index 2006 for two samples of “Pharmacology and Pharmacy” and “Psychiatry” journals computed from the ISI Web of Science. For the two samples, the IF and the h-index rankings of the journals are very different. The correlation coefficient between the IF and the h-index is high for Psychiatry but lower for Pharmacology. The linearity test performed between the h-index and IF alpha/alpha+1.n(1/alpha+1) showed the great sensitivity of the model compared with alpha. The IF and h-index can be completely complementary when evaluating journals of the same scientific discipline.

Keywords: Citation, Correlation, h Index, h-Index, Hirsch Index, IF, Impact, Impact Factor, ISI, ISI Web, ISI Web of Science, Journal Impact Factor, Journal Ranking, Journals, Model, Parameters, Pharmacology, Psychiatry, Publication, Rankings, Science, Web of Science

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Full Text: [2010\Scientometrics84, 81.pdf](2010/Scientometrics84,%2081.pdf)

Abstract: This study investigates the knowledge diffusion patterns of Nanoscience & Nanotechnology (N&N) by analyzing the overall research interactions between N&N and nano-related subjects through citation analysis. Three perspectives were investigated to achieve this purpose. Firstly, the overall research interactions were analyzed to identify the dominant driving forces in advancing the development of N&N. Secondly, the knowledge diffusion intensity between N&N and nano-related subjects was investigated to determine the areas most closely related to N&N. Thirdly, the diffusion speed was identified to detect the time distance of knowledge diffusion between N&N and nano-related subjects. The analysis reveals that driving forces from the outside environment rather than within N&N itself make the foremost contributions to the development of N&N. From 1998 to 2007, Material Science, Physics, Chemistry, N&N, Electrical & Electronic and Metallurgy & Metallurgical Engineering are the key contributory and reference subjects for N&N. Knowledge transfer within N&N itself is the quickest. And the speed of knowledge diffusion from other subjects to N&N is slower than that from N&N to other subjects, demonstrating asymmetry of knowledge diffusion in the development of N&N. The results indicate that N&N has matured into a relatively open, diffuse and dynamic system of interactive subjects.

Keywords: Asymmetry, Chemistry, Citation, Citation Analysis, Development, Diffusion, Environment, Exploration, Field, Flows, Impact Factors, Knowledge, Knowledge Diffusion, Nanoscience, Nanoscience & Nanotechnology, Nanotechnology, Patent Citations, Physics, Publication Delays, Research, Science, Scientific Literature, System, Technology, Weak Ties

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Full Text: [2010\Scientometrics84, 99.pdf](2010/Scientometrics84,%2099.pdf)

Abstract: Countries often spend billions on university research. There is growing interest in how to assess whether that money is well spent. Is there an objective way to assess the quality of a nation’s world-leading science? I suggest a method, and illustrate it with data on economics. Of 450 genuinely world-leading journal articles, the UK produced 10% and the rest of Europe slightly more. Interestingly, more than a quarter of these UK articles came from outside the best-known university departments. The proposed methodology could be applied to almost any academic discipline or nation.

Keywords: Academic Discipline, Articles, Citation Counts, Citations, Economics, Europe, European Economics, Evaluation, Journal, Journals, Measurement, Methodology, Peer-Review, Quality, Research, Research Assessment Exercise (Rae), Research Excellence Framework (Ref), Science, Science, UK, United Kingdom, University, University Research

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Full Text: [2010\Scientometrics84, 115.pdf](2010/Scientometrics84,%20115.pdf)

Abstract: A relation, established by Andras Schubert (Scientometrics 78(3): 559-565, 2009) on the relation between a paper’s h-index and its total number of received citations, is explained. The relation is a concavely increasing power law and is explained based on the Lotkaian model for the h-index, proved by Egghe and Rousseau.

Keywords: Citations, h Index, h-Index, Hirsch-Index, Model, Power Law, Scientometrics, Single Paper h-Index, Single Paper Hirsch-Index

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Full Text: [2010\Scientometrics84, 119.pdf](2010/Scientometrics84,%20119.pdf)

Abstract: The acquisition of new technologies represents a vitally important and fundamental goal of many corporate managers, particularly those within the medical device industry. We collect data on ten medical device companies as our sample in this study, covering the period from 1990 to 2006, this sample is drawn from the top 20 companies in the US, on the basis of international sales performance. We also collect details on all of the acquisitions undertaken by these companies, along with their patenting performance. The empirical results of this study suggest that technological acquisitions are only likely to be of help to the acquiring firms, in terms of improving their innovative performance, if they set out to acquire those companies that are in similar proximity, in terms of their technological field. There is also a clear need for such acquiring firms to ensure their continuing commitment to internal R&D investment in order to maintain their own versatility.

Keywords: Biotechnology Industry, Empirical-Analysis, Firms, Impact, Industry, Innovation, International, M&A, Medical, Patent Diversity, Patent Stock, Performance, R&D, Strategies, US, US Medical Device Industry

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Full Text: [2010\Scientometrics84, 133.pdf](2010/Scientometrics84,%20133.pdf)

Abstract: Hirsch’s concept of h-index was used to define a similarity measure for journals. The h-similarity is easy to calculate from the publicly available data of the Journal Citation Reports, and allows for plausible interpretation. On the basis of h-similarity, a relative eminence indicator of journals was determined: the ratio of the JCR impact factor to the weighted average of that of similar journals. This standardization allows journals from disciplines with lower average citation level (mathematics, engineering, etc.) to get into the top lists.

Keywords: Citation, Citation Analysis, Citation-Reports, Cocitation Analysis, Engineering, h Index, h-Index, h-Similarity, Impact, Impact Factor, Impact Factors, Index, Interpretation, Journal Citation Reports, Journals, Lists, Mathematics, Networks, Relatedness, Science, Scientific Journals, Similarity, Standardized Impact Factor

? Prathap, G. (2010), Going much beyond the Durfee square: enhancing the h (T) index. *Scientometrics*, **84** (1), 149-152.

Full Text: [2010\Scientometrics84, 149.pdf](2010/Scientometrics84,%20149.pdf)

Abstract: The h-index is now used almost as a canonical tool for research assessment of individuals, research faculties and institutions and even for comparing performance of journals and countries. However, its limitations have also been noticed and many Hirsch-type variants have been proposed. In this paper, a “mock h-index” which was recently proposed is compared with the “tapered h-index”.

Keywords: Assessment, Bibliometrics, Corrected Quality Ratio, h Index, h-Index, Hirsch-Type Indexes, Indicators, Journals, Mock h-Index, Output, Performance, Research, Research Assessment, Tapered h-Index

? Prathap, G. (2010), Is there a place for a mock h-index? *Scientometrics*, **84** (1), 153-165.

Full Text: [2010\Scientometrics84, 153.pdf](2010/Scientometrics84,%20153.pdf)

Abstract: The h-index has captured the imagination of scientometricians and bibliometricians to such an extent that one can now divide the history of the subject virtually into a pre-Hirsch and a post-Hirsch period. Beyond its academic value, it is now used as a tool for research assessment of individuals, research faculties and institutions and even for comparing performance of journals and countries. Since its introduction, many Hirsch-type variants have been proposed to overcome perceived limitations of the original index. In this paper, using ideas from mathematical modeling, another mock h-index is proposed which may complement the h-index and give it better resolving power.

Keywords: Assessment, Bibliometrics, Corrected Quality Ratio, h Index, h-Index, Hirsch-Type Indexes, History, Journals, Mathematical Modeling, Mock h-Index, Modeling, Performance, Research, Research Assessment, Science

? Prathap, G. (2010), The 100 most prolific economists using the p-index. *Scientometrics*, **84** (1), 167-172.

Full Text: [2010\Scientometrics84, 167.pdf](2010/Scientometrics84,%20167.pdf)

Abstract: In this paper, a new indicator called the performance index (p-index) is used to rank a 100 most prolific economists. The p-index strikes the best balance between activity (total citations C) and excellence (mean citation rate C/P). The surprise is that the h-index, which is now universally accepted almost as a canonical tool for research assessment of individuals, research faculties and institutions and even for comparing performance of journals and countries, is actually a poor indicator of performance.

Keywords: Assessment, Bibliometrics, Citation, Citations, g-Index, h Index, h-Index, h-Index, Hirsch-Type Indexes, Indicators, Journals, Output, p-Index, Performance, Research, Research Assessment

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Full Text: [2010\Scientometrics84, 173.pdf](2010/Scientometrics84,%20173.pdf)

Abstract: It is widely recognized that collaboration between the public and private research sectors should be stimulated and supported, as a means of favoring innovation and regional development. This work takes a bibliometric approach, based on co-authorship of scientific publications, to propose a model for comparative measurement of the performance of public research institutions in collaboration with the domestic industry collaboration with the private sector. The model relies on an identification and disambiguation algorithm developed by the authors to link each publication to its real authors. An example of application of the model is given, for the case of the academic system and private enterprises in Italy. The study demonstrates that for each scientific discipline and each national administrative region, it is possible to measure the performance of individual universities in both intra-regional and extra-regional collaboration, normalized with respect to advantages of location. Such results may be useful in informing regional policies and merit-based public funding of research organizations.

Keywords: Bibliometric, Bibliometrics, Co-Authorship, Co-Authorships, Collaboration, Development, Flows, Funding, Identification, Industry, Industry Interaction, Innovation, Italy, Knowledge Spillovers, Measurement, Model, Performance, Public Funding of Research, Public Research, Publication, Publications, Regional, Research, Research Collaboration, Research Institutions, Research Productivity, Science, Scientific Publications, System, Universities, University, University-Industry Research Collaboration

? Hypponen, K. and Paganuzzi, V.M. (2010), Computer science research articles: the locations of different section types, and a proposal for standardization in the structure. *Scientometrics*, **84** (1), 199-220.

Full Text: [2010\Scientometrics84, 199.pdf](2010/Scientometrics84,%20199.pdf)

Abstract: This paper presents an analysis of the structure of computer science research articles published in the Lecture Notes of Computer Science series. While it is clear that most articles start with an Introduction and end with a Conclusion, the structure of text between these two sections is rather diverse. We studied the positions of different section types, and analysed dependencies between them. As a result, we present a number of common patterns used by writers, and make suggestions on how to improve the presentation of research in computer science.

Keywords: Articles, Computer, Computer Science, Linguistics, Presentation of Research, Research, Research Article, Science, Standardisation, Structure

? Zuccala, A. (2010), The mathematical review system: Does reviewer status play a role in the citation process? *Scientometrics*, **84** (1), 221-235.

Full Text: [2010\Scientometrics84, 221.pdf](2010/Scientometrics84,%20221.pdf)

Abstract: This paper revisits an aspect of citation theory (i.e., citer motivation) with respect to the Mathematical Review system and the reviewer’s role in mathematics. We focus on a set of journal articles (369) published in Singularity Theory (1974-2003), the mathematicians who wrote editorial reviews for these articles, and the number of citations each reviewed article received within a 5 year period. Our research hypothesis is that the cognitive authority of a high status reviewer plays a positive role in how well a new article is received and cited by others. Bibliometric evidence points to the contrary: Singularity Theorists of lower status (junior researchers) have reviewed slightly more well-cited articles (2-5 citations, excluding author self-citations) than their higher status counterparts (senior researchers). One explanation for this result is that lower status researchers may have been asked to review ‘trendy’ or more accessible parts of mathematics, which are easier to use and cite. We offer further explanations and discuss a number of implications for a theory of citation in mathematics. This research opens the door for comparisons to other editorial review systems, such as book reviews written in the social sciences or humanities.

Keywords: Articles, Bibliometric, Citation, Citation Theory, Citations, Citer Motivation, Editorial Reviews, Humanities, Journal, Mathematics, Play, Positive, Research, Researchers, Review, Science, Self-Citations, Social Sciences, Sociology, System, Theory

? Billaut, J.C., Bouyssou, D. and Vincke, P. (2010), Should you believe in the Shanghai ranking? *Scientometrics*, **84** (1), 237-263.

Full Text: [2010\Scientometrics84, 237.pdf](2010/Scientometrics84,%20237.pdf)

Abstract: This paper proposes a critical analysis of the “Academic Ranking of World Universities”, published every year by the Institute of Higher Education of the Jiao Tong University in Shanghai and more commonly known as the Shanghai ranking. After having recalled how the ranking is built, we first discuss the relevance of the criteria and then analyze the proposed aggregation method. Our analysis uses tools and concepts from Multiple Criteria Decision Making (MCDM). Our main conclusions are that the criteria that are used are not relevant, that the aggregation methodology is plagued by a number of major problems and that the whole exercise suffers from an insufficient attention paid to fundamental structuring issues. Hence, our view is that the Shanghai ranking, in spite of the media coverage it receives, does not qualify as a useful and pertinent tool to discuss the “quality” of academic institutions, let alone to guide the choice of students and family or to promote reforms of higher education systems. We outline the type of work that should be undertaken to offer sound alternatives to the Shanghai ranking.

Keywords: Academic Ranking, Attention, Bibliometric Methods, Coverage, Criteria, DEA, Decision-Making Units, Education, Evaluation Models, Exercise, Fatal Attraction, Higher Education, Index, League Tables, Methodology, Multiple Criteria Decision Analysis, National Research Performance, Ranking, Shanghai, Shanghai Ranking, Tools, University, University Rankings, World Universities

? Chen, J.H., Jang, S.L. and Wen, S.H. (2010), Measuring technological diversification: identifying the effects of patent scale and patent scope. *Scientometrics*, **84** (1), 265-275.

Full Text: [2010\Scientometrics84, 265.pdf](2010/Scientometrics84,%20265.pdf)

Abstract: Although technological diversification is an important strategic decision for both large and small firms alike, the conventional method of measuring such diversification may well introduce significant scale bias against small- and medium-sized firms. We examine this issue in this study using a sample of 73 Taiwanese integrated-circuit (IC) design firms covering the period from 1995 to 2007 and conclude that the conventional measure of technological diversification reflects the spread or distribution amongst technology classes of a company’s current technology portfolio, and does not capture the incremental expansion in technological scope, or the ‘dynamic act of diversification’, as reflected in our alternative scope measure. Our results suggest clear constraints on the applications made under the conventional index, particularly for firms with small patent scale.

Keywords: Applications, Bias, Distribution, Effects, Expansion, Field, Firms, IC Design Firms, Innovation, Patent, Patent Scope, Performance, Scale, Technological Diversification, Technology

? Schultz, D.M. (2010), Are three heads better than two? How the number of reviewers and editor behavior affect the rejection rate. *Scientometrics*, **84** (2), 277-292.

Full Text: [2010\Scientometrics84, 277.pdf](2010/Scientometrics84,%20277.pdf)

Abstract: Editors of peer-reviewed journals obtain recommendations from peer reviewers as guidance in deciding upon the suitability of a submitted manuscript for publication. To investigate whether the number of reviewers used by an editor affects the rate at which manuscripts are rejected, 500 manuscripts submitted to Monthly Weather Review during 15.5 months in 2007-2008 were examined. Two and three reviewers were used for 306 and 155 manuscripts, respectively (92.2% of all manuscripts). Rejection rates for initial decisions and final decisions were not significantly different whether two or three reviewers were used. Manuscripts with more reviewers did not spend more rounds in review or have different rejection rates at each round. The results varied by editor, however, with some editors rejecting more two-reviewer manuscripts and others rejecting more three-reviewer manuscripts. Editors described using their scientific expertise in the decision-making process, either in determining the number of reviews to be sought or in making decisions once the reviews were received, approaches that differ from that of relying purely upon reviewer agreement as reported previously in the literature. A simple model is constructed for three decision-making strategies for editors: rejection when all reviewers recommend rejection, rejection when any reviewer recommends rejection, and rejection when a majority of reviewers recommend rejection. By plotting the probability of reviewer rejection against the probability of editor rejection, the decision-making process can be graphically illustrated, demonstrating that, for this dataset, editors are likely to reject a manuscript when any reviewer recommends rejection.

Keywords: Editor, Editors, Journal, Journals, Literature, Manuscripts, Model, Monthly Weather Review, Peer Review, Publication, Rejection, Reliability, Review, Reviewer Agreement, Rounds of Reviews

? Zhao, D.Z. (2010), Characteristics and impact of grant-funded research: A case study of the library and information science field. *Scientometrics*, **84** (2), 293-306.

Full Text: [2010\Scientometrics84, 293.pdf](2010/Scientometrics84,%20293.pdf)

Abstract: This paper reports on a bibliometric study of the characteristics and impact of research in the library and information science (LIS) field which was funded through research grant programs, and compares it with research that received no extra funding. Seven core LIS journals were examined to identify articles published in 1998 that acknowledge research grant funding. The distribution of these articles by various criteria (e.g., topic, affiliation, funding agency) was determined. Their impact as indicated by citation counts during 1998-2008 was evaluated against that of articles without acknowledging extra funding and published in the same journals in the same year using citation data collected from Scopus’ Citation Tracker. The impact of grant-funded research as measured by citation counts was substantially higher than that of other research, both overall and in each journal individually. Scholars from outside LIS core institutions contributed heavily to grant-funded research. The two highest-impact publications by far reported non-grant-based research, and grant-based funding of research reported in core LIS journals was biased towards the information retrieval (IR) area, particularly towards research on IR systems. The percentage of articles reporting grant-funded research was substantially higher in information-oriented journals than in library-focused ones.

Keywords: Affiliation, Articles, Bibliometric, Bibliometric Study, Characteristics, Citation, Citation Analysis, Citation Counts, Core, Criteria, Distribution, Funding, Highest Impact, Impact, Information Retrieval, Information Science, IR, Journal, Journals, Library and Information Science, LIS, Publications, Research, Research Evaluation, Research Funding, Research Policy, Science, Scientific Collaboration, Scopus, Topic

? Pautasso, M. and Schafer, H. (2010), Peer review delay and selectivity in ecology journals. *Scientometrics*, **84** (2), 307-315.

Full Text: [2010\Scientometrics84, 307.pdf](2010/Scientometrics84,%20307.pdf)

Abstract: Peer review is fundamental to science as we know it, but is also a source of delay in getting discoveries communicated to the world. Researchers have investigated the effectiveness and bias of various forms of peer review, but little attention has been paid to the relationships among journal reputation, rejection rate, number of submissions received and time from submission to acceptance. In 22 ecology/interdisciplinary journals for which data could be retrieved, higher impact factor is positively associated with the number of submissions. However, higher impact factor journals tend to be significantly quicker in moving from submission to acceptance so that journals which receive more submissions are not those which take longer to get them through the peer review and revision processes. Rejection rates are remarkably high throughout the journals analyzed, but tend to increase with increasing impact factor and with number of submissions. Plausible causes and consequences of these relationships for journals, authors and peer reviewers are discussed.

Keywords: Attention, Bias, Editorial Rejection, Effectiveness, Impact, Impact Factor, Journal, Journals, Peer Review, Peer-Review, Peer-Reviewed Literature, Publication, Publish or Perish, Quality Control, Rejection, Review, Science, Scientific Technological and Medical (STM) Publishing, Selectivity, Standing of a Journal

? Derrick, G.E., Sturk, H., Haynes, A.S., Chapman, S. and Hall, W.D. (2010), A cautionary bibliometric tale of two cities. *Scientometrics*, **84** (2), 317-320.

Full Text: [2010\Scientometrics84, 317.pdf](2010/Scientometrics84,%20317.pdf)

Abstract: Reliability of citation searches is a cornerstone of bibliometric research. The authors compare simultaneous search returns at two sites to demonstrate discrepancies that can occur as a result of differences in institutional subscriptions to the Web of Science and Web of Knowledge. Such discrepancies may have significant implications for the reliability of bibliometric research in general, but also for the calculation of individual and group indices used for promotion and funding decisions. The authors caution care when describing the methods used in bibliometric analysis and when evaluating researchers from different institutions. In both situations a description of the specific databases used would enable greater reliability.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Research, Citation, Citation Analysis, Databases, Evaluative Bibliometrics, Funding, Impact, Index, Institutional Subscriptions, Knowledge, Methods, Promotion, Publication, Reliability, Research, Researchers, Science, Web of Knowledge, Web of Science

? Ortega, J.L. and Aguillo, I.F. (2010), Describing national science and technology systems through a multivariate approach: Country participation in the 6th Framework Programmes. *Scientometrics*, **84** (2), 321-330.

Full Text: [2010\Scientometrics84, 321.pdf](2010/Scientometrics84,%20321.pdf)

Abstract: The objective of this work is to describe the distribution of different types of participating organizations in the health thematic area of the 6th Framework Programme. A total of 2132 different organizations were classified according to four types and then grouped by country. A Principal Component Analysis (PCA) was carried out on the percentage of funding obtained by each type of organization. Results show a countries map plotted around the “private” and “public” principal components. It is observed that there are countries which research is basically performed by government research centres, while others are supported in the university activity. We conclude that the PCA is a suitable method to plot the distribution of research organizations by country and the results could be used as a tool for theoretical studies about the scientific activity in a country.

Keywords: 6th Framework Programme, Biomedicine, Classification, Distribution, Funding, Health, Impact, Multivariate Analysis, National Science, PCA, Research, Science, Science and Technology, Scientometrics, Space, Technology, Triple Helix, University

? Guan, J.C. and Wang, G.B. (2010), A comparative study of research performance in nanotechnology for China’s inventor-authors and their non-inventing peers. *Scientometrics*, **84** (2), 331-343.

Full Text: [2010\Scientometrics84, 331.pdf](2010/Scientometrics84,%20331.pdf)

Abstract: This paper explores the relationship between patenting and publishing in the field of nanotechnology for Chinese universities. With their growing patents, Chinese universities are becoming main technological source for nanotechnology development that is extremely important in China. Matching names of patentees to names of research paper authors in Chinese universities, we find 6,321 authors with patents, i.e. inventor-authors, and 65,001 without any patent. Research performance is measured using three indicators-publication counts, total citations and h-index received by each researcher. It is found that research performance of authors who are also inventors holding patents is better than that of those authors who do not have a patent, and that most of high quality research is performed by inventor-authors. Our findings indicate that patent-oriented research may produce better results.

Keywords: Bibliometrics, China, Citations, Development, Field, h Index, h-Index, Index, Inventor-Authors, Journals, Nanoscience, Nanotechnology, Patent, Patents, Performance, Publications, Publishing, Research, Research Performance, Science, Terms, Universities, University Patenting

? Gentil-Beccot, A., Mele, S. and Brooks, T.C. (2010), Citing and reading behaviours in high-energy physics. *Scientometrics*, **84** (2), 345-355.

Full Text: [2010\Scientometrics84, 345.pdf](2010/Scientometrics84,%20345.pdf)

Abstract: Contemporary scholarly discourse follows many alternative routes in addition to the three-century old tradition of publication in peer-reviewed journals. The field of High-Energy Physics (HEP) has explored alternative communication strategies for decades, initially via the mass mailing of paper copies of preliminary manuscripts, then via the inception of the first online repositories and digital libraries. This field is uniquely placed to answer recurrent questions raised by the current trends in scholarly communication: is there an advantage for scientists to make their work available through repositories, often in preliminary form? Is there an advantage to publishing in Open Access journals? Do scientists still read journals or do they use digital repositories? The analysis of citation data demonstrates that free and immediate online dissemination of preprints creates an immense citation advantage in HEP, whereas publication in Open Access journals presents no discernible advantage. In addition, the analysis of clickstreams in the leading digital library of the field shows that HEP scientists seldom read journals, preferring preprints instead.

Keywords: Citation, Communication, Digital Libraries, Digital Library, Discourse, Energy Physics, High, Impact, Journals, Libraries, Manuscripts, Open-Access, Open-Access, Physics, Publication, Publishing, Reading, Repository, Scholarly Communication, Trends

? Nejati, A. and Jenab, S.M.H. (2010), A two-dimensional approach to evaluate the scientific production of countries (case study: the basic sciences). *Scientometrics*, **84** (2), 357-364.

Full Text: [2010\Scientometrics84, 357.pdf](2010/Scientometrics84,%20357.pdf)

Abstract: The quantity and quality of scientific output of the topmost 50 countries in the four basic sciences (agricultural & biological sciences, chemistry, mathematics, and physics & astronomy) are studied in the period of the recent 12 years (1996-2007). In order to rank the countries, a novel two-dimensional method is proposed, which is inspired by the h-index and other methods based on quality and quantity measures. The countries data are represented in a “quantity-quality diagram”, and partitioned by a conventional statistical algorithm into three clusters, members of which are rather the same in all of the basic sciences. The results offer a new perspective on the global positions of countries with regards to their scientific output.

Keywords: Algorithm, Basic Science, Biological, Biological Sciences, Chemistry, Global, h-Index, Impact, Index, Mathematics, Methods, Nations, Output, Production, Quality, Quantity, Ranking, Scientific Output, Scientific Production, Statistical

? Savanur, K. and Srikanth, R. (2010), Modified collaborative coefficient: A new measure for quantifying the degree of research collaboration. *Scientometrics*, **84** (2), 365-371.

Full Text: [2010\Scientometrics84, 365.pdf](2010/Scientometrics84,%20365.pdf)

Abstract: Collaborative coefficient (CC) is a measure of collaboration in research, that reflects both the mean number of authors per paper as well as the proportion of multi-authored papers. Although it lies between the values 0 and 1, and is 0 for a collection of purely single-authored papers, it is not 1 for the case where all papers are maximally authored, i.e., every publication in the collection has all authors in the collection as co-authors. We propose a simple modification of CC, which we call modified collaboration coefficient (or MCC, for short), which improves its performance in this respect.

Keywords: Collaboration, Collaborative Coefficient, Multiple Authorship, Performance, Publication, Research, Research Collaboration

? Sooryamoorthy, R. (2010), Science and scientific collaboration in South Africa: Apartheid and after. *Scientometrics*, **84** (2), 373-390.

Full Text: [2010\Scientometrics84, 373.pdf](2010/Scientometrics84,%20373.pdf)

Abstract: Scientific collaboration is growing in its importance, more so in Asian and African countries. This paper examines the scenario of science and scientific collaboration in South Africa which had passed through the colonial and apartheid regimes before it became a democracy in 1994. South African science under distinct political periods moved through some difficult periods but it did not badly affect the progress and direction of South African science. Science and scientific collaboration continued to grow under its major political phases amidst serious challenges. Despite internal conflict and boycott by the international scientific community, South Africa could move onto a stable and steady path of growth in science and collaboration under apartheid which is being carried on in the new South Africa. Collaborative research is encouraged at various levels of knowledge production and in science. The importance science and scientific development is gaining in today’s South Africa is remarkable.

Keywords: Africa, Apartheid, Collaboration, Development, Growth, Indicators, International, Knowledge, Knowledge Production, Medicine, Nations, Organization, Production, Research, Research-and-Development, Scenario, Science, Scientific Collaboration, South Africa, State, Technology

? Han, C.S., Lee, S.K. and England, M. (2010), Transition to postmodern science-related scientometric data. *Scientometrics*, **84** (2), 391-401.

Full Text: [2010\Scientometrics84, 391.pdf](2010/Scientometrics84,%20391.pdf)

Abstract: A change in scientific developments in recent decades is widely proclaimed which may be associated with terms like postmodern science or steady state science. This change is usually discussed from a more epistemological viewpoint. In order to enhance the understanding of the underlying key factors, bibliometric, demographic and Nobel Prize recipient data spanning of the last hundred years are considered and analyzed. It is found that in general the considered data point to a quasi-steady state in bibliometric developments of highly developed countries. For emerging countries, such a steady state is not yet attained, therefore, the research output in scientific journal articles is still expected to rise considerably. Consequences and interpretations of an ever growing research output in relation to the increasing age of Nobel Prize recipients are discussed and conclusions are drawn from the considered data.

Keywords: Articles, Bibliometric, Biblometrics, Change, Demography, Exponential-Growth, Innovation, Journal, Nobel Prize, Postmodern Science, Research, Research Output, Science, Scientific Journal, State, Steady State, Steady State Science

? Mahbuba, D. and Rousseau, R. (2010), Scientific research in the Indian subcontinent: selected trends and indicators 1973-2007 comparing Bangladesh, Pakistan and Sri Lanka with India, the local giant. *Scientometrics*, **84** (2), 403-420.

Full Text: [2010\Scientometrics84, 403.pdf](2010/Scientometrics84,%20403.pdf)

Abstract: As part of a research program to analyse research in Bangladesh we provide a comparison between research indicators related to India, Bangladesh, Pakistan and Sri Lanka. In this investigation we make use of Web of Science (WoS) data as well as Scopus data (using the SCImago website). Special attention is given to collaboration data and to the evolution of country h-indices. A comparison based on relative quality indicators shows that Sri Lanka is the best performer among these four countries. Such a result agrees with the ranking of these countries according to the United Nations’ Human Development Index (HDI).

Keywords: Asia, Attention, Bangladesh, Citation, Collaboration, Comparison, Country h-Indices, Development, Evolution, Impact, Index, India, Indicators, Local, Pakistan, Publication Analysis, Research, Science, Scimago, Scopus, Sri Lanka, Trends, Web of Science, WOS

? Zhang, L., Zhao, H.A., Li, Q.S., Wang, J.A. and Tan, X. (2010), Establishment of paper assessment system based on academic disciplinary benchmarks. *Scientometrics*, **84** (2), 421-429.

Full Text: [2010\Scientometrics84, 421.pdf](2010/Scientometrics84,%20421.pdf)

Abstract: An article assessment system based on both Tianjin University and nine key Chinese Universities’ academic disciplinary benchmarks was established to evaluate researcher’s published papers. With this scientific benchmarking system, the quality of a researcher’s papers could be easily located in a percentile scale in corresponding field within certain groups. Several factors, including total number of papers, order of authors, impact of journals, citation count, h-index, e-index, a-index, m-quotient, etc., were also utilized for both quantity and quality analysis. Furthermore, the novel proposed weighted citation analysis was introduced to judge a researcher’s contribution to his/her research outcomes. The convenient application and comprehensive evaluation property of this assessment system was thoroughly discussed via a given example.

Keywords: Article Assessment System, Articles, Assessment, Benchmarking, Benchmarks, Citation, Citation Analysis, Citation Count, Citations, Contribution, Evaluation, Groups, h Index, h-Index, Impact, Index, Journals, Outcomes, Research, Research Performance Assessment, Scale, System, Universities, University

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Full Text: [2010\Scientometrics84, 431.pdf](2010/Scientometrics84,%20431.pdf)

Abstract: The set of citations received by a set of publications consists of citations received by articles in the h-core and citations received by articles in the h-tail. Denoting the cardinalities of these fours sets as C, P, C (H) and C (T) we introduce the tail-core ratio (C (T)/C (H)) and show that in practical cases this ratio tends to increase. Introducing further the k-index, defined as k = (C/P)/(C (T)/C (H)), we show that this index decreases in most practical cases. A power law model is in accordance with these practical observations.

Keywords: Articles, Citations, h, h-Core, h-Index, h-Tail, Index, K-Index, Model, Power Law, Publications, Tail-Core Ratio, V-Index

? Marx, W. and Bornmann, L. (2010), How accurately does Thomas Kuhn’s model of paradigm change describe the transition from the static view of the universe to the big bang theory in cosmology? *Scientometrics*, **84** (2), 441-464.

Full Text: [2010\Scientometrics84, 441.pdf](2010/Scientometrics84,%20441.pdf)

Abstract: Up to the 1960s the prevalent view of science was that it was a step-by-step undertaking in slow, piecemeal progression towards truth. Thomas Kuhn argued against this view and claimed that science always follows this pattern: after a phase of “normal” science, a scientific “revolution” occurs. Taking as a case study the transition from the static view of the universe to the Big Bang theory in cosmology, we appraised Kuhn’s theoretical approach by conducting a historical reconstruction and a citation analysis. As the results show, the transition in cosmology can be linked to many different persons, publications, and points in time. The findings indicate that there was not one (short term) scientific revolution in cosmology but instead a paradigm shift that progressed as a slow, piecemeal process.

Keywords: Bibliometrics, Change, Chemistry, Citation, Citation Analysis, Citation Counts, Cosmology, Distance, Distributions, Extra-Galactic Nebulae, Historical Reconstruction, Model, Paradigm, Progression, Publications, Radiation, Reconstruction, Relativity, Science, Scientific Discovery, Theory, Thomas Kuhn, Velocity

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Full Text: [2010\Scientometrics84, 465.pdf](2010/Scientometrics84,%20465.pdf)

Abstract: Over the last years the h-index has gained popularity as a measure for comparing the impact of scientists. We investigate if ranking according to the h-index is stable with respect to (i) different choices of citation databases, (II) normalizing citation counts by the number of authors or by removing self-citations, (iii) small amounts of noise created by randomly removing citations or publications and (iv) small changes in the definition of the index. In experiments for 5,283 computer scientists and 1,354 physicists we show that although the ranking of the h-index is stable under most of these changes, it is unstable when different databases are used. Therefore, comparisons based on the h-index should only be trusted when the rankings of multiple citation databases agree.

Keywords: Citation, Citation Counts, Citation Databases, Citations, Computer, Databases, h Index, h-Index, Impact, Noise, Publications, Ranking Scientists, Rankings, Self-Citations, Stability, Stability Analysis

? Boshoff, N. (2010), South-South research collaboration of countries in the Southern African Development Community (SADC). *Scientometrics*, **84** (2), 481-503.

Full Text: [2010\Scientometrics84, 481.pdf](2010/Scientometrics84,%20481.pdf)

Abstract: This study investigates South-South collaboration in research, and specifically collaboration among the 15 countries of the Southern African Development Community (SADC) as well as between the SADC and the rest of Africa. It was found that only 3% of SADC papers during 2005-2008 were jointly authored by researchers from two or more SADC countries (intra-regional collaboration), and only 5% of SADC papers were jointly authored with researchers from African countries outside the SADC (continental collaboration). In contrast, 47% of SADC papers were co-authored with scientists from high-income countries. The few instances of intra-regional and continental collaboration in the SADC are largely the product of North-South collaboration. Authors from high-income countries are included in 60% of intra-regional co-authored papers and in 59% of continental co-authored papers. Moreover, between 2005 and 2008, South Africa produced 81% of all SADC papers and 78% of all intra-regional co-authored papers. This implies that there is a highly unbalanced and unequal partnership that can best be described as a variant of North-South collaboration with the scientific giant in the South taking on the role of the ‘political North’. As a consequence, guidelines for successful North-South collaborations should be extended to include South-South collaborations that comprise highly unequal partners, as is the case between South Africa and the other SADC countries.

Keywords: Africa, Authors, Co-Authorship, Co-Authorships, Collaboration, Context, Development, North, North-South Collaboration, Regional Integration, Research, Research Collaboration, Researchers, Science, South Africa, South-South Collaboration, Southern African Development Community (SADC)

? Kim, M.J. (2010), Visibility of Korean science journals: An analysis between citation measures among international composition of editorial board and foreign authorship. *Scientometrics*, **84** (2), 505-522.

Full Text: [2010\Scientometrics84, 505.pdf](2010/Scientometrics84,%20505.pdf)

Abstract: This article reports findings from a study of the relationship between citation measures (impact factor and its quartile) among international composition of editorial board and foreign authorship in 17 Korean SCI journals for the three 5-year periods, 1995, 2000, and 2005. With few exceptions, the relationship between international editorial board composition and foreign authorship and citation measures was non-existent, at p > 0.05. However, the international members on editorial boards and foreign authorship of papers in Korean journals have increased greatly over the three 5-year periods, and there has been to a certain degree growth in the visibility and performance of Korean SCI journals in terms of impact factors, but not their quartiles.

Keywords: Authorship, Citation, Citation Measures, Composition, Foreign Authorship, Growth, Impact, Impact Factor, Impact Factors, International, International Composition of Editorial Board, Journals, Korean Science Journals, Performance, SCI, Science, Scientific Journals, Visibility

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Full Text: [2010\Scientometrics84, 523.pdf](2010/Scientometrics84,%20523.pdf)

Abstract: We present VOSviewer, a freely available computer program that we have developed for constructing and viewing bibliometric maps. Unlike most computer programs that are used for bibliometric mapping, VOSviewer pays special attention to the graphical representation of bibliometric maps. The functionality of VOSviewer is especially useful for displaying large bibliometric maps in an easy-to-interpret way. The paper consists of three parts. In the first part, an overview of VOSviewer’s functionality for displaying bibliometric maps is provided. In the second part, the technical implementation of specific parts of the program is discussed. Finally, in the third part, VOSviewer’s ability to handle large maps is demonstrated by using the program to construct and display a co-citation map of 5,000 major scientific journals.

Keywords: Attention, Bibliometric, Bibliometric Mapping, Co-Citation, Computational Intelligence Field, Computer, Computer Programs, Graphs, Journal Co-Citation Analysis, Journals, Mapping, Maps, Pathfinder Networks, Science, Science Mapping, Scientific Journals, Survey, Visualization, VOS, Vosviewer

? Lortie, C.J. (2010), Letter to the editor: A global comment on scientific publications, productivity, people, and beer. *Scientometrics*, **84** (2), 539-541.

Full Text: [2010\Scientometrics84, 539.pdf](2010/Scientometrics84,%20539.pdf)

Keywords: Editor, Global, Nations, Productivity, Publications, Scientific Publications

? Lim, H. and Park, Y. (2010), Identification of technological knowledge intermediaries. *Scientometrics*, **84** (3), 543-561.

Full Text: [2010\Scientometrics84, 543.pdf](2010/Scientometrics84,%20543.pdf)

Abstract: Intermediaries in a technological knowledge network have recently been highlighted as crucial innovation drivers that accelerate technological knowledge flows. Although the patent network analysis has been frequently used to monitor technological knowledge structures, it has examined only sources or recipients of the technological knowledge by mainly estimating technological knowledge inflows or outflows of a network node. This study, therefore, aims to identify technological knowledge intermediaries when a technology-level knowledge network is composed of several industries. First, types of technological knowledge flows are deductively classified into four types by highlighting industry affiliations of source technologies and recipient technologies. Second, a directed technological knowledge network is generated at the technology class level, using patent co-classification analysis. Third, for each class, mediating scores are measured according to the four types. The empirical analysis illustrates the Korea’s technological knowledge network between 2000 and 2008. As a result, the four types of mediating scores are compared between industries, and industry-wise technological knowledge intermediaries are identified. The proposed approach is practical to explore converging processes in technology development where technology classes act as technological knowledge intermediaries among diverse industries.

Keywords: Betweenness, Brokerage, Centrality, Firms, Industry Affiliation, Innovations, Knowledge Network, Network Analysis, Patent Co-Classification, Patent Statistics, Perspective, Positions, Research-and-Development, Spillovers, Technological Knowledge Intermediary

? Yanagisawa, K., Ito, K., Katsuki, C., Kawashima, K. and Shirabe, M. (2010), An outcome of nuclear safety research in JAERI: case study for LOCA. *Scientometrics*, **84** (3), 563-573.

Full Text: [2010\Scientometrics84, 563.pdf](2010/Scientometrics84,%20563.pdf)

Abstract: An outcome of nuclear safety research (NSR) done by JAERI (Japan Atomic Energy Research Institute) was case studied by the bibliometric method. (1) For LOCA (loss-of-coolant accident) a domestic share of JAERI in monoclinic research paper was 63% at the past (20) 1978-1982 but was decreased to 40% at the present 1998-2002. For co-authored papers a domestic share between JAERI and PS (public sectors) was zero at past (20) but increased to 4% at the present. Research cooperation is active between Tokyo University and JAERI or between JAERI and Nagoya University. (2) It is revealed that LOCA outputs born by NSR-JAERI reflected partly to those of the Safety Licensing Guidelines, however, a share of NSR-JAERI could not determined due to the lack of necessary information in the Guideline.

Keywords: Bibliometrics, Jaeri, Loca, Nuclear Safety Research, Outcome, Research, Safety Licensing Guideline, University

? Larsen, P.O. and von Ins, M. (2010), The rate of growth in scientific publication and the decline in coverage provided by Science Citation Index. *Scientometrics*, **84** (3), 575-603.

Full Text: [2010\Scientometrics84, 575.pdf](2010/Scientometrics84,%20575.pdf)

Abstract: The growth rate of scientific publication has been studied from 1907 to 2007 using available data from a number of literature databases, including Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Traditional scientific publishing, that is publication in peer-reviewed journals, is still increasing although there are big differences between fields. There are no indications that the growth rate has decreased in the last 50 years. At the same time publication using new channels, for example conference proceedings, open archives and home pages, is growing fast. The growth rate for SCI up to 2007 is smaller than for comparable databases. This means that SCI was covering a decreasing part of the traditional scientific literature. There are also clear indications that the coverage by SCI is especially low in some of the scientific areas with the highest growth rate, including computer science and engineering sciences. The role of conference proceedings, open access archives and publications published on the net is increasing, especially in scientific fields with high growth rates, but this has only partially been reflected in the databases. The new publication channels challenge the use of the big databases in measurements of scientific productivity or output and of the growth rate of science. Because of the declining coverage and this challenge it is problematic that SCI has been used and is used as the dominant source for science indicators based on publication and citation numbers. The limited data available for social sciences show that the growth rate in SSCI was remarkably low and indicate that the coverage by SSCI was declining over time. National Science Indicators from Thomson Reuters is based solely on SCI, SSCI and Arts and Humanities Citation Index (AHCI). Therefore the declining coverage of the citation databases problematizes the use of this source.

Keywords: Big Science, Citation, Coverage of Conference Proceedings, Coverage of Databases, Coverage of Science Citation Index, Cumulative Values, Databases for Scientific Publications, Doubling Time, Exponential Growth, Google Scholar, Growth Rate for Science, Growth Rate for Scientific Publication, Indicator, Little Science, Low, Number of Scientific Journals, Publication, SCI, Scopus, Web

? Abramo, G., D’Angelo, C.A. and Solazzi, M. (2010), National research assessment exercises: a measure of the distortion of performance rankings when labor input is treated as uniform. *Scientometrics*, **84** (3), 605-619.

Full Text: [2010\Scientometrics84, 605.pdf](2010/Scientometrics84,%20605.pdf)

Abstract: Measuring the efficiency of scientific research activity presents critical methodological aspects, many of which have not been sufficiently studied. Although many studies have assessed the relation between quality and research productivity and academic rank, not much is known about the extent of distortion in national university performance rankings when academic rank and the other labor factors are not considered as a factor of normalization. This work presents a comparative analysis that aims to quantify the sensitivity of bibliometric rankings to the choice of input, with input considered as only the number of researchers on staff, or alternatively where their cost is also considered. The field of observation consists of all 69 Italian universities active in the hard sciences. Performance measures are based on the 81,000 publications produced during the 2004-2006 triennium by all 34,000 research staff, with analysis carried out at the level of individual disciplines, 187 in total. The effect of the switch from labor to cost seems to be minimal except for a few outliers.

Keywords: Bibliometric Indicators, Bibliometrics, Cost Efficiency, Gender, Methodology, Research, Research Productivity, Research Productivity, Scientists, Universities, University Ranking

? Cardoso, A.R., Guimaraes, P. and Zimmermann, K.F. (2010), Comparing the early research performance of PhD graduates in labor economics in Europe and the USA. *Scientometrics*, **84** (3), 621-637.

Full Text: [2010\Scientometrics84, 621.pdf](2010/Scientometrics84,%20621.pdf)

Abstract: This paper analyzes the early research performance of PhD graduates in labor economics, addressing the following questions: Are there major productivity differences between graduates from American and European institutions? If so, how relevant is the quality of the training received (i.e. ranking of institution and supervisor) and the research environment in the subsequent job placement institution? The population under study consists of labor economics PhD graduates who received their degree in the years 2000-2005 in Europe or the USA. Research productivity is evaluated alternatively as the number of publications or the quality-adjusted number of publications of an individual. When restricting the analysis to the number of publications, results suggest a higher productivity by graduates from European universities than from USA universities, but this difference vanishes when accounting for the quality of the publication. The results also indicate that graduates placed at American institutions, in particular top ones, are likely to publish more quality-adjusted articles than their European counterparts. This may be because, when hired, they already have several good acceptances or because of more focused research efforts and clearer career incentives.

Keywords: Education, Graduate Programs, Incentives, Job Placements, Publication, Publication Analysis, Research, Research Productivity, Research Productivity

? Yin, C.Y., Aris, M.J. and Chen, X. (2010), Combination of Eigenfactor (TM) and h-index to evaluate scientific journals. *Scientometrics*, **84** (3), 639-648.

Full Text: [2010\Scientometrics84, 639.pdf](2010/Scientometrics84,%20639.pdf)

Abstract: The h-index and Eigenfactor (TM) values of top and specialized scientific/engineering journals are tabulated and combined to provide a simple graphical representation of the journals. The information may be tailored to specific uses by respective stakeholders to aid decision making processes with regards to scholarly research and scientific journal publications.

Keywords: Eigenfactor (TM) Score, h-Index, Impact Factor, Journal Impact Factor, Journal Status, Research

? Ramos-Vielba, I., Fernandez-Esquinas, M. and Espinosa-de-los-Monteros, E. (2010), Measuring university-industry collaboration in a regional innovation system. *Scientometrics*, **84** (3), 649-667.

Full Text: [2010\Scientometrics84, 649.pdf](2010/Scientometrics84,%20649.pdf)

Abstract: Studies of university-industry collaboration remain subject to important limitations due to the shortage of empirical data and a lack of consistency in that obtained to date. This article puts into practice a set of universities Third Mission indicators in a regional innovation system. Selected indicators previously compiled from literature were reorganized and pre-tested. We have undertaken two face-to-face surveys of 737 firms and 765 heads of research teams, respectively. The results test the validation of indicators and provide a complex map of university-industry linkages as well as some observations on the flexibility needed to address this issue.

Keywords: Indicators, Indicators, Institutionalization, Knowledge Transfer, Links, Regional Innovation System, Research, Science, Technology, University-Industry Collaboration, US

? Wong, C.Y. and Goh, K.L. (2010), Modeling the behaviour of science and technology: self-propagating growth in the diffusion process. *Scientometrics*, **84** (3), 669-686.

Full Text: [2010\Scientometrics84, 669.pdf](2010/Scientometrics84,%20669.pdf)

Abstract: Through theoretical analysis and empirical demonstration, this paper attempts to model the behavior of science and technology by investigating the self-propagating behavior of their diffusion for South Korea, Malaysia and Japan. The dynamics of the self-propagating behavior were examined using the logistic growth function within a dynamic carrying capacity, while allowing for different effectiveness of potential influence of science and technology producers on potential adopters. Evidence suggests that the self-propagating growth function is particularly relevant for countries with advanced science and technology, like Japan. While self-propagating growth was also found for South Korea, the diffusion process remained fairly static for Malaysia.

Keywords: Capacity, Carrying Capacity, China, Countries, Diffusion, Dynamism, Emergence, Functionality Development, Growth Function, Industry, Innovation, Knowledge, Science, Systems, Technology

? Pepe, A. and Rodriguez, M.A. (2010), Collaboration in sensor network research: an in-depth longitudinal analysis of assortative mixing patterns. *Scientometrics*, **84** (3), 687-701.

Full Text: [2010\Scientometrics84, 687.pdf](2010/Scientometrics84,%20687.pdf)

Abstract: Many investigations of scientific collaboration are based on statistical analyses of large networks constructed from bibliographic repositories. These investigations often rely on a wealth of bibliographic data, but very little or no other information about the individuals in the network, and thus, fail to illustrate the broader social and academic landscape in which collaboration takes place. In this article, we perform an in-depth longitudinal analysis of a relatively small network of scientific collaboration (N = 291) constructed from the bibliographic record of a research centerin the development and application of wireless and sensor network technologies. We perform a preliminary analysis of selected structural properties of the network, computing its range, configuration and topology. We then support our preliminary statistical analysis with an in-depth temporal investigation of the assortative mixing of selected node characteristics, unveiling the researchers’ propensity to collaborate preferentially with others with a similar academic profile. Our qualitative analysis of mixing patterns offers clues as to the nature of the scientific community being modeled in relation to its organizational, disciplinary, institutional, and international arrangements of collaboration.

Keywords: Co-Authorship, Coauthorship, Community, Discrete Assortativity, Growth, Homophily, Mixing Patterns, Network Evolution, Physics, Research, Science, Scientific Collaboration Networks, Sensor Network And Wireless Research, Social Network

? Macias-Chapula, C. (2010), Influence of local and regional publications in the production of public health research papers in Latin America. *Scientometrics*, **84** (3), 703-716.

Full Text: [2010\Scientometrics84, 703.pdf](2010/Scientometrics84,%20703.pdf)

Abstract: The study seeks to identify the influence of local and regional publications in the production of public health research papers in the Latin American region. A citation analysis of the papers published in the following three leading journals in the field of public health was conducted: Revista M,dica de Chile (Chile) (RMCh), Archivos Latinoamericanos de Nutricin (Venezuela) (ALAN), and Salud PA(0)blica de M,xico (M,xico) (SPM). Papers were analyzed for the period 2003-2007. SciELO (Scientific Electronic Library Online) and the printed version of the journals were used in the analysis. Overall, 1,273 papers from 122 journal issues were analyzed. References accounted for a total of 38,459. Over 90% of the production was published through the collaboration of two or more authors. Author affiliation corresponded in most cases to the country of origin of the journal. References to Portuguese papers accounted for nearly 5% in ALAN and less than 1% each in SPM and RMCh. Citations among the three journals were not significant. Only ALAN cited RMCh and SPM over 3% each, of total citations. SPM and RMCh cited each other less than 1% of total citations. With the exception of ALAN, most public health papers published in RMCh and SPM derived from the national collaboration of researchers in the field. A small amount of public health knowledge communication was being transferred from Brazil to the region through RMCh and SPM. A vertical and individual (per journal/country) model of knowledge communication in public health was identified.

Keywords: Bibliometric Analysis, Citation Analysis, Citations, Countries, De-Saude-Publica, Health Journals, Knowledge Management, Latin America, Output, Public Health Research, Research, Salud

? Lee, G.J. (2010), Assessing publication performance of research units: extensions through operational research and economic techniques. *Scientometrics*, **84** (3), 717-734.

Full Text: [2010\Scientometrics84, 717.pdf](2010/Scientometrics84,%20717.pdf)

Abstract: Many quantitative measures exist to assess the publishing outputs of research units such as university departments or institutes. In addition to well-known issues with such measures, further shortcomings include inadequate adjustments for relative entity sizes and researcher intensity, the extent to which research is concentrated among a few rather than all researchers and lags between staffing and publication. This article presents a further array of possible measurement indices, based on operational research and economic ratios, which are capable of adjusting for each of these shortcomings, and which analysts can combine with relatively little effort into existing measures.

Keywords: Bibliometrics, Concentration, Higher-Education, Indicators, Inequality, Institutions, Lag in Research, Politics, Profiles, Publication, Research, Research Measures, Research Output, Research Productivity, Research Units, Scientific Productivity, University Departments

? Wang, J.C., Chiang, C.H. and Lin, S.W. (2010), Network structure of innovation: can brokerage or closure predict patent quality? *Scientometrics*, **84** (3), 735-748.

Full Text: [2010\Scientometrics84, 735.pdf](2010/Scientometrics84,%20735.pdf)

Abstract: Patents are important intellectual assets for companies to defend or to claim their technological rights. To control R&D cost, companies should carefully examine their patents by patent quality. Approaches to evaluating patent quality are mostly a posteriori uses of factual information of patent quality. This paper examined whether patent quality can be predicted a priori, i.e., during the early years after a patent is granted, by analyzing information embedded in a network of patent citations. Social network analysis was applied to analyze two network positions occupied by a patent, brokerage and closure to determine whether either position is a good predictor of patent quality. Patent renewal decisions and forward citations were adopted as surrogates of patent quality. The analytical results showed that forward citations can be positively predicted by the brokerage position and negatively predicted by the closure position in the early and mature stages. Renewal decisions can be negatively predicted by the brokerage position in the early stage, and the closure position influences the renewal decision in a different way in the early and mature stages. These analytical results imply that a company should focus on developing patents that bridge different technologies as its technological developments reach maturity.

Keywords: Brokerage, Citations, Closure, Linkage, Market Value, Multiple Indicators, Patent Citation Network, Performance, Research-and-Development, Science, Social Network Analysis, Stock, Strategic Alliances, Technology

? Lillquist, E. and Green, S. (2010), The discipline dependence of citation statistics. *Scientometrics*, **84** (3), 749-762.

Full Text: [2010\Scientometrics84, 749.pdf](2010/Scientometrics84,%20749.pdf)

Abstract: This study compares the citations characteristics of researchers in engineering disciplines with other major scientific disciplines, and investigates variations in citing patterns within subdisciplines in the field of engineering. Utilizing citations statistics including Hirsch’s (Proc Natl Acad Sci USA 102(46):16569-16572, 2005) h-index value, we find that significant differences in citing characteristics exist between engineering disciplines and other scientific fields. Our findings also reveal statistical differences in citing characteristics between subdisciplines found within the same engineering discipline.

Keywords: Citations, Discipline, Field, Fields, h-Index, h-Index, Impact, Science, Statistics

? Tang, L. and Walsh, J.P. (2010), Bibliometric fingerprints: name disambiguation based on approximate structure equivalence of cognitive maps. *Scientometrics*, **84** (3), 763-784.

Full Text: [2010\Scientometrics84, 763.pdf](2010/Scientometrics84,%20763.pdf)

Abstract: Authorship identity has long been an Achilles’ heel in bibliometric analyses at the individual level. This problem appears in studies of scientists’ productivity, inventor mobility and scientific collaboration. Using the concepts of cognitive maps from psychology and approximate structural equivalence from network analysis, we develop a novel algorithm for name disambiguation based on knowledge homogeneity scores. We test it on two cases, and the results show that this approach outperforms other common authorship identification methods with the ASE method providing a relatively simple algorithm that yields higher levels of accuracy with reasonable time demands.

Keywords: Approximate Structural Equivalence, Authorship, Bibliometric, Citation Analysis, Cognitive Map, Common Names, Hierarchical Clustering, Impact, Knowledge Homogeneity Score, Name Disambiguation, Nanotechnology, Publications, Science, Web

? Hagen, N.T. (2010), Harmonic publication and citation counting: sharing authorship credit equitably - not equally, geometrically or arithmetically. *Scientometrics*, **84** (3), 785-793.

Full Text: [2010\Scientometrics84, 785.pdf](2010/Scientometrics84,%20785.pdf)

Abstract: Bibliometric counting methods need to be validated against perceived notions of authorship credit allocation, and standardized by rejecting methods with poor fit or questionable ethical implications. Harmonic counting meets these concerns by exhibiting a robust fit to previously published empirical data from medicine, psychology and chemistry, and by complying with three basic ethical criteria for the equitable sharing of authorship credit. Harmonic counting can also incorporate additional byline information about equal contribution, or the elevated status of a corresponding last author. By contrast, several previously proposed counting schemes from the bibliometric literature including arithmetic, geometric and fractional counting, do not fit the empirical data as well and do not consistently meet the ethical criteria. In conclusion, harmonic counting would seem to provide unrivalled accuracy, fairness and flexibility to the long overdue task of standardizing bibliometric allocation of publication and citation credit.

Keywords: Bibliometric, Bibliometric Counting, Bibliometry, Consequences, Counting Bias, Multiple Authorship, Publication, Validation

? Egghe, L. (2010), Letter to the editor: On RandiA double dagger’s H-sequence. *Scientometrics*, **84** (3), 795-797.

Full Text: 2010\Scientometrics84, 795.pdf

? Garcia-Carpintero, E., Granadino, B. and Plaza, L.M. (2010), The representation of nationalities on the editorial boards of international journals and the promotion of the scientific output of the same countries. *Scientometrics*, **84** (3), 799-811.

Full Text: [2010\Scientometrics84, 799.pdf](2010/Scientometrics84,%20799.pdf)

Abstract: This paper analyses the nationalities of the editorial board members of the top 20 journals (according to their impact factor in the ISI Journal Citation Report, Science Edition 2005) serving 15 scientific disciplines. A total of 281 journals were analysed (some journals crossed disciplinary boundaries) and 10,055 of their editorial board members were identified. Some 53% of board members were from the United States. Europe provided 32%, with the United Kingdom making the greatest contribution (9.8%). The analysis of scientific output by nationality in these journals showed a significant correlation, in all disciplines, with the representation of the corresponding nations on the editorial boards. The composition of editorial boards may therefore provide a useful indicator for measuring a country’s international scientific visibility. The present results should be taken into account in the design of national policies with the aim of enhancing the presence of a country’s most prestigious scientists on the editorial boards of the main international journals.

Keywords: Citation, Editorial Boards, Gatekeeping Patterns, Impact Factor, Indicator, Internationalisation Indicators, Journal, Science, Science Journals, Scientific Journals, Visibility of Science

? Wang, M.H., Yu, T.C. and Ho, Y.S. (2010), A bibliometric analysis of the performance of *Water Research*. *Scientometrics*, **84** (3), 813-820.

Full Text: [2010\Scientometrics-Ho1.pdf](2010/Scientometrics-Ho1.pdf), [2010\Scientometrics-Ho2.pdf](2010/Scientometrics-Ho2.pdf), [2010\Scientometrics84, 813.pdf](2010/Scientometrics84,%20813.pdf)

Abstract: This paper presents a detailed chronological survey of papers published in the journal titled Water Research which started publication since 1967. This current investigation reviews publication patterns between 1967 and 2008. An analysis of the research performance according to publication output, distribution of words in article title, author keywords, and keywords plus. Performances of countries, institutes, and authors, including total, single, collaborative, first author, and corresponding author publications were analyzed. The most-frequently cited articles each year and the articles of the highest impact in 2008 were also reported. Results showed that “activated sludge” was the most frequently used author keyword, followed by “adsorption,” and “drinking water.” Authors from 114 different countries/territories published in the journal, with the most articles submitted by authors from the USA.

Keywords: Author Keywords, Citation, Citations, Journal, Publication, Publications, References, Research, SCI, Scientometrics, Water

? Abramo, G., D’Angelo, C.A. and Di Costa, F. (2010), Citations versus journal impact factor as proxy of quality: could the latter ever be preferable? *Scientometrics*, **84** (3), 821-833.

Full Text: [2010\Scientometrics84, 821.pdf](2010/Scientometrics84,%20821.pdf)

Abstract: In recent years bibliometricians have paid increasing attention to research evaluation methodological problems, among these being the choice of the most appropriate indicators for evaluating quality of scientific publications, and thus for evaluating the work of single scientists, research groups and entire organizations. Much literature has been devoted to analyzing the robustness of various indicators, and many works warn against the risks of using easily available and relatively simple proxies, such as journal impact factor. The present work continues this line of research, examining whether it is valid that the use of the impact factor should always be avoided in favour of citations, or whether the use of impact factor could be acceptable, even preferable, in certain circumstances. The evaluation was conducted by observing all scientific publications in the hard sciences by Italian universities, for the period 2004-2007. Performance sensitivity analyses were conducted with changing indicators of quality and years of observation.

Keywords: Bibliometrics, Citations, Impact Factor, Research, Research Assessment, Research Evaluation, Research Productivity, University

? Ortega, J.L. and Aguillo, I.F. (2010), Network collaboration in the 6th Framework Programmes: country participation in the health thematic area. *Scientometrics*, **84** (3), 835-844.

Full Text: [2010\Scientometrics84, 835.pdf](2010/Scientometrics84,%20835.pdf)

Abstract: This paper aims to explore the role of each country in the health thematic area of the 6th Framework Programme (6FP) of the EU. We try to explain how the collaborative research processes are generated in a research programme using social network analysis (SNA) tools. We have modelled a one-mode network set up by 2,132 organizations which participate in 601 research projects. This network was shrunk at the country level, obtaining a network of 31 countries. Results show that there is a strong relationship between R&D indicators and the structural position of each country in the network. The paper concludes that the SNA techniques are a suitable tool to assess the country performance in the EU research programmes.

Keywords: Centrality, Country Collaboration, Emergence, EU Research Programmes, Indicators, Network Analyses, Research, Science, Scientometrics

? Hofer, K.M., Smejkal, A.E., Bilgin, F.Z. and Wuehrer, G.A. (2010), Conference proceedings as a matter of bibliometric studies: The Academy of International Business 2006-2008. *Scientometrics*, **84** (3), 845-862.

Full Text: [2010\Scientometrics84, 845.pdf](2010/Scientometrics84,%20845.pdf)

Abstract: This study does a bibliometric analysis based on keywords of conference proceedings. Scientometric investigations of conference proceedings are a new and innovative, not very common approach. The studies and papers presented may be interpreted as early indicators of scientific development. The Academy of International Business (AIB) was chosen for being the leading organization for studies in international business with contributions covering a 3-year period (2006-2008). The study presents the general structure of current scholarly interest in international business studies, clusters the keywords and reflects details on the focused research areas of the papers analyzed. The bibliometric analysis indicates three clusters: the core, the semi-periphery and the periphery. The five most occurring keywords were found to be multinational enterprise, emerging markets, foreign direct investment, internationalization and knowledge management in descending order. The analyses focus on concepts building the core (in total ten keywords), the semi-periphery which is coined by performance and related topics (60 keywords) and the periphery of the studies with governance and specific facets of it (199 keywords).

Keywords: Co-Word Analysis, Cocitation, Conference Proceedings, Content Analysis, Countries, Emerging Economies, Field, Foreign Direct-Investment, Globalization, Information, International Business, Knowledge Management, Methodology, Ranking, Research, Science, Scientometrics, Theory Development

? Sooryamoorthy, R. (2010), Medical research in South Africa: A scientometric analysis of trends, patterns, productivity and partnership. *Scientometrics*, **84** (3), 863-885.

Full Text: [2010\Scientometrics84, 863.pdf](2010/Scientometrics84,%20863.pdf)

Abstract: Being a scientifically active country in Africa, South Africa has made significant strides in the production of scientific publications. Medicine is one branch of science that has achieved a remarkable position in this regard. Extracting and analyzing medical publications for three decades and at regular intervals (1975-2005) from the SCI database, this paper pioneers an attempt to find out whether the reported pace of growth in the production of scientific papers in medicine is an effect of partnerships that scholars have with their counterparts within the organization, within the country, or with those in other countries. This paper also presents the unique patterns of scientific research in medicine, taking into account factors such as the count and fractional count of papers, citations, trends of growth, sectoral participation, partners, and publication outlets, and seeks to provide new insights into the directions medical science is taking in South Africa today.

Keywords: Authorship, Citation, Health, Indicators, International Collaboration, Medicine, Networks, Output, Partnership, Productivity, Publication, Research, SCI, Science, Scientific Collaboration, Scientometric Analysis, South Africa

? Hodder, A.P.W. and Hodder, C. (2010), Research culture and New Zealand’s performance-based research fund: some insights from bibliographic compilations of research outputs. *Scientometrics*, **84** (3), 887-901.

Full Text: [2010\Scientometrics84, 887.pdf](2010/Scientometrics84,%20887.pdf)

Abstract: Year-on-year trends in research outputs show increases in research activity as the date of the research assessment exercise-in New Zealand the Performance-Based Research Fund (PBRF)-looms. Moreover, changes with time in the number and types of conference presentation indicate that the vehicle of publication is also being influenced by the PBRF. Within New Zealand business schools, relating the published journal articles to the Australian Business Deans Council rankings list shows a trend towards more publications of lower rank, raising doubts about whether the rhetoric about the PBRF raising the quality of research is really justified. This ‘drive’ towards increasing numbers of research outputs is also fostered by an increasing trend towards co-authorship in publishing across all disciplines.

Keywords: Author Collaboration, Performance-Based Research Fund (PBRF), Publication, Research, Research Assessment Exercise, Research Collaboration, Research Outputs, Research Publications, Research Quality

? Mesnard, L. (2010), On Hochberg et al.’s “The tragedy of the reviewer commons”. *Scientometrics*, **84** (3), 903-917.

Full Text: [2010\Scientometrics84, 903.pdf](2010/Scientometrics84,%20903.pdf)

Abstract: We discuss each of the recommendations made by Hochberg et al. (Ecol Lett 12:2-4, 2009) to prevent the “tragedy of the reviewer commons”. Having scientific journals share a common database of reviewers would be to recreate a bureaucratic organization, where extra-scientific considerations prevailed. Pre-reviewing of papers by colleagues is a widespread practice but raises problems of coordination. Revising manuscripts in line with all reviewers’ recommendations presupposes that recommendations converge, which is acrobatic. Signing an undertaking that authors have taken into accounts all reviewers’ comments is both authoritarian and sterilizing. Sending previous comments with subsequent submissions to other journals amounts to creating a cartel and a single all-encompassing journal, which again is sterilizing. Using young scientists as reviewers is highly risky: they might prove very severe, and if they are not yet published authors themselves, the recommendation violates the principle of peer review. Asking reviewers to be more severe would only create a crisis in the publishing houses and actually increase reviewers’ workloads. The criticisms of the behavior of authors looking to publish in the best journals are unfair: it is natural for scholars to try to publish in the best journals and not to resign themselves to being second rate. Punishing lazy reviewers would only lower the quality of reports: instead, we favor the idea of paying reviewers “in kind” with, say, complimentary books or papers.

Keywords: Articles, Association, Book Reviews, Editor, Evaluative Content, Hochberg, Impact, Manuscripts, Publication, Publisher, Publishing, Referee, Referees, Reviewer, Science Journals, Sociology, Tragedy of the Commons

? Padial, A.A., Nabout, J.C., Siqueira, T., Bini, L.M. and Diniz, J.A.F. (2010), Weak evidence for determinants of citation frequency in ecological articles. *Scientometrics*, **85** (1), 1-12.

Full Text: [2010\Scientometrics85, 1.pdf](2010/Scientometrics85,%201.pdf)

Abstract: Citation frequency has been considered a biased surrogate of publication merit. However, previous studies on this subject were based on small sample sizes and were entirely based on null-hypothesis significance testing. Here we evaluated the relative effects of different predictors on citation frequency of ecological articles using an information theory framework designed to evaluate multiple competing hypotheses. Supposed predictors of citation frequency (e.g., number of authors, length of articles) accounted for a low fraction of the total variation. We argue that biases concerning citation are minor in ecology and further studies that attempt to quantify the scientific relevance of an article, aiming to make further relationships with citation, are needed to advance our understanding of why an article is cited.

Keywords: Biases, Citation Frequency, Ecological Articles, Ecology, Journal Impact, Merit, Publication, Rates, Tool

? Giuliani, F., De Petris, M.P. and Nico, G. (2010), Assessing scientific collaboration through coauthorship and content sharing. *Scientometrics*, **85** (1), 13-28.

Full Text: [2010\Scientometrics85, 13.pdf](2010/Scientometrics85,%2013.pdf)

Abstract: Over the past decade there have been many investigations aimed at defining the role of scientists and research groups in their coauthorship networks. Starting from the assumptions of network analysis, in this work we propose an analytical definition of a collaboration potential between authors of scientific papers based on both coauthorships and content sharing. The collaboration potential can also be considered a useful tool to investigate the relationships between a single scientist and research groups, thus allowing for the identification of characteristic “types” of scientists (integrated, independent, etc.). We computed the collaboration potential for a set of authors belonging to research groups of an institute specialized in the field of Medical Genetics. The methods presented in the paper are rather general as they can be applied to compute a collaboration potential for a network of cooperating actors in every situation in which one can qualify the content of some activities and which of them are in common among the actors of the network.

Keywords: Classification, Coauthorships, Collaboration Potential, Community, Impact, Network Analysis, Patterns, R&D Networks, Research, Science, Scientific Collaborations, Semantic Web

? Fisher, E., Slade, C.P., Anderson, D. and Bozeman, B. (2010), The public value of nanotechnology? *Scientometrics*, **85** (1), 29-39.

Full Text: [2010\Scientometrics85, 29.pdf](2010/Scientometrics85,%2029.pdf)

Abstract: Science and innovation policy (SIP) is typically justified in terms of public values while SIP program assessments are typically limited to economic terms that imperfectly take into account these values. The study of public values through public value mapping (PVM) lacks widely-accepted methods for systematically identifying value structures within SIP and its public policy processes, especially when there are multiple stakeholder groups. This paper advances the study of public values in SIP using nanoscale science and engineering (NSE) policy by demonstrating that quantitative analysis of value statements can provide a credible and robust basis for policy analysis. We use content analysis of over 1,000 documents with over 100,000 pages from major contributors to the NSE policy discourse to identify and analyze a wide range of public value statements. Data analysis and reduction methods reveal a multifactor structure of public values that has been consistently cited by a range of actors in an NSE research policy network.

Keywords: Nanotechnology, Public Policy Analysis, Public Values, Research, Science And Technology Policy, Valuation

? Bartneck, C. and Hu, J. (2010), The fruits of collaboration in a multidisciplinary field. *Scientometrics*, **85** (1), 41-52.

Full Text: [2010\Scientometrics85, 41.pdf](2010/Scientometrics85,%2041.pdf)

Abstract: Collaboration between researchers and between research organizations is generally considered a desirable course of action, in particular by some funding bodies. However, collaboration within a multidisciplinary community, such as the Computer-Human Interaction (CHI) community, can be challenging. We performed a bibliometric analysis of the CHI conference proceedings to determine if papers that have authors from different organization or countries receive more citations than papers that are authored by members of the same organization. There was no significant difference between these three groups, indicating that there is no advantage for collaboration in terms of citation frequency. Furthermore, we tested if papers written by authors from different organizations or countries receive more best paper awards or at least award nominations. Papers from only one organization received significantly fewer nominations than collaborative papers.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometrics, Citations, Collaboration, Impact, Organizations, Research, Science

? Aminpour, F., Kabiri, P., Boroumand, M.A., Keshtkar, A.A. and Hejazi, S.S. (2010), Iranian Medical Universities in SCIE: Evaluation of address variation. *Scientometrics*, **85** (1), 53-63.

Full Text: [2010\Scientometrics85, 53.pdf](2010/Scientometrics85,%2053.pdf)

Abstract: Applying different institutional addresses in the scientific production of a same university has underestimated the scientific production of Iranian universities and consequently lowered their position in the international academic rankings for a long time. The present study evaluated the scientific production of Iranian medical universities according to their institutional addresses registered in the papers indexed by Science Citation Index Expanded (SCIE). By conducting a descriptive research we retrieved total SCIE indexed of top Iranian medical universities and their respective hospitals and research centers from the beginning of 1986 to the end of 2007. Then different variations of the institutional addresses of each university in the author affiliation of papers were assessed. Finally the universities were ranked according to observing a uniformed format for more registered addresses in SCIE. The findings showed unexpected diversity in the institutional affiliation of each university in their SCIE indexed papers. Although “Tehran University of Medical Sciences” showed the most variation in registering institutional addresses but ranked first according to observing unification for more addresses in the SCIE indexed papers comparing to the other universities. The problem of applying different institutional affiliations in the scientific production of the universities should be valued enough by the whole scientific community. Observing a uniformed format in registering institutional addresses of Iranian medical universities would affect their scientific credibility and international ranks through representing their real scientific productivity.

Keywords: Academic Rankings, Articles, Author Affiliation, Fatal Attraction, Institutional Affiliation, Iranian Universities, Rankings, Research, Science Citation Index Expanded, Scientific Productivity

? Su, H.N. and Lee, P.C. (2010), Mapping knowledge structure by keyword co-occurrence: A first look at journal papers in Technology Foresight. *Scientometrics*, **85** (1), 65-79.

Full Text: [2010\Scientometrics85, 65.pdf](2010/Scientometrics85,%2065.pdf)

Abstract: This study proposes an approach for visualizing a knowledge structure, the proposed approach creates a three-dimensional “Research focused parallelship network”, a “Keyword Co-occurrence Network”, and a two-dimensional knowledge map to facilitate visualization of the knowledge structure created by journal papers from different perspectives. The networks and knowledge maps can be depicted differently by choosing different information as the network actor, e.g. author, institute or country keyword, to reflect knowledge structures in micro-, meso-, and macro-levels, respectively. Technology Foresight is selected as an example to illustrate the method proposed in this study. A total of 556 author keywords contained in 181 Technology Foresight related papers have been analyzed. European countries, China, India and Brazil are located at the core of Technology Foresight research. Quantitative ways of mapping journal papers are investigated in this study to unveil emerging elements as well as to demonstrate dynamics and visualization of knowledge. The quantitative method provided in this paper shows a possible way of visualizing and evaluating knowledge structure, thus a computerized calculation is possible for potential quantitative applications, e.g. R&D resource allocation, research performance evaluation, science map, etc.

Keywords: Bibliometric Analysis, Co-Word Analysis, Database Tomography, Discovery Lrd, Infrastructure, Keyword, Knowledge Structure, Network Theory, Neural-Network Research, Parkinsons-Disease, Potential Treatments, Research, Science-And-Technology, Scientometrics, Technology Foresight

? Elkins, M.R., Maher, C.G., Herbert, R.D., Moseley, A.M. and Sherrington, C. (2010), Correlation between the Journal Impact Factor and three other journal citation indices. *Scientometrics*, **85** (1), 81-93.

Full Text: [2010\Scientometrics85, 81.pdf](2010/Scientometrics85,%2081.pdf)

Abstract: To determine the degree of correlation among journal citation indices that reflect the average number of citations per article, the most recent journal ratings were downloaded from the websites publishing four journal citation indices: the Institute of Scientific Information’s journal impact factor index, Eigenfactor’s article influence index, SCImago’s journal rank index and Scopus’ trend line index. Correlations were determined for each pair of indices, using ratings from all journals that could be identified as having been rated on both indices. Correlations between the six possible pairings of the four indices were tested with Spearman’s rho. Within each of the six possible pairings, the prevalence of identifiable errors was examined in a random selection of 10 journals and among the 10 most discordantly ranked journals on the two indices. The number of journals that could be matched within each pair of indices ranged from 1,857 to 6,508. Paired ratings for all journals showed strong to very strong correlations, with Spearman’s rho values ranging from 0.61 to 0.89, all p < 0.001. Identifiable errors were more common among scores for journals that had very discordant ranks on a pair of indices. These four journal citation indices were significantly correlated, providing evidence of convergent validity (i.e. they reflect the same underlying construct of average citability per article in a journal). Discordance in the ranking of a journal on two indices was in some cases due to an error in one index.

Keywords: Bibliometric Analysis, Citation Analysis, Impact Factor, Nonsense, Science, Sense, Tool

? Moehrle, M.G. (2010), Measures for textual patent similarities: A guided way to select appropriate approaches. *Scientometrics*, **85** (1), 95-109.

Full Text: [2010\Scientometrics85, 95.pdf](2010/Scientometrics85,%2095.pdf)

Abstract: The measurement of textual patent similarities is crucial for important tasks in patent management, be it prior art analysis, infringement analysis, or patent mapping. In this paper the common theory of similarity measurement is applied to the field of patents, using solitary concepts as basic textual elements of patents. After unfolding the term ‘similarity’ in a content and formal oriented level and presenting a basic model of understanding, a segmented approach to the measurement of underlying variables, similarity coefficients, and the criteria-related profiles of their combinations is lined out. This leads to a guided way to the application of textual patent similarities, interesting both for theory and practice.

Keywords: Infringement Analysis, Patent, Patent Mapping, Prior Art Analysis, Representations, Science Maps, Similarity Coefficients, Similarity Measurement

? Ohniwa, R.L., Hibino, A. and Takeyasu, K. (2010), Trends in research foci in life science fields over the last 30 years monitored by emerging topics. *Scientometrics*, **85** (1), 111-127.

Full Text: [2010\Scientometrics85, 111.pdf](2010/Scientometrics85,%20111.pdf)

Abstract: We report here a simple method to identify the ‘emerging topics’ in life sciences. First, the keywords selected from MeSH terms on PubMed by filtering the terms based on their increment rate of the appearance, and, then, were sorted into groups dealing with the same topics by ‘co-word’ analysis. These topics were defined as ‘emerging topics’. The survey of the emerging keywords with high increment rates of appearance between 1972 to 2006 showed that emerging topics changed dramatically year by year, and that the major shift of the topics occurred in the late 90s, the topics that cover technical and conceptual aspects in molecular biology to the more systematic ‘-omics’-related and nanoscience-related aspects. We further investigated trends in emerging topics within various sub-fields in the life sciences.

Keywords: Co-Word Analysis, Co-Word Analysis, Emerging Topics, Knowledge, Mesh Terms, Networks, Patterns, Pubmed, Research, Trends In Life Science

? Parker, J.N., Lortie, C. and Allesina, S. (2010), Characterizing a scientific elite: The social characteristics of the most highly cited scientists in environmental science and ecology. *Scientometrics*, **85** (1), 129-143.

Full Text: [2010\Scientometrics85, 129.pdf](2010/Scientometrics85,%20129.pdf)

Abstract: In science, a relatively small pool of researchers garners a disproportionally large number of citations. Still, very little is known about the social characteristics of highly cited scientists. This is unfortunate as these researchers wield a disproportional impact on their fields, and the study of highly cited scientists can enhance our understanding of the conditions which foster highly cited work, the systematic social inequalities which exist in science, and scientific careers more generally. This study provides information on this understudied subject by examining the social characteristics and opinions of the 0.1% most cited environmental scientists and ecologists. Overall, the social characteristics of these researchers tend to reflect broader patterns of inequality in the global scientific community. However, while the social characteristics of these researchers mirror those of other scientific elites in important ways, they differ in others, revealing findings which are both novel and surprising, perhaps indicating multiple pathways to becoming highly cited.

Keywords: Authors, Citation, Citation Analysis, Ecology, Environmental Science, Gender-Differences, Highly-Cited, Level, Productivity, Publication Output, Scientific Elite, Specialization, Stratification

? Pouris, A. (2010), A scientometric assessment of the Southern Africa Development Community: Science in the tip of Africa. *Scientometrics*, **85** (1), 145-154.

Full Text: [2010\Scientometrics85, 145.pdf](2010/Scientometrics85,%20145.pdf)

Abstract: This article reports the results of a scientometric assessment of the Southern Africa Development Community countries. The National Science Indicators database of Thomson-Reuters and the online ISI Web of Knowledge are utilized in order to identify the number of publications of the 15 countries over a period of 15 years, the activity and relative impact indicators of 22 scientific disciplines for each country and their collaborative patterns. It is identified that South Africa with 19% of the population in the region is responsible for 60% of the regional GDP and 79% of the regions publications. All countries tend to have the same focus in their disciplinary priorities and underemphasize disciplines such as engineering, materials science and molecular biology. It is expressed concern that the current research infrastructures are inadequate to assist in reaching the objectives developed in the Regional Indicative Strategic Development Plan of the Community.

Keywords: Assessment, Impact, Indicators, ISI, Research, SADC, Scientometrics, Southern Africa

? Schultz, L.I. and Joutz, F.L. (2010), Methods for identifying emerging General Purpose Technologies: A case study of nanotechnologies. *Scientometrics*, **85** (1), 155-170.

Full Text: [2010\Scientometrics85, 155.pdf](2010/Scientometrics85,%20155.pdf)

Abstract: Nanotechnology is an emerging field of science with the potential to generate new and enhance existing products and transform the production process. US patent data is used to track the emergence of nanotechnologies since 1978. The nanotechnologies that have undergone the most development are identified using patent citation data and cocitation patterns of patents are examined to define clusters of related nanotechnologies. The potential for economic impact of the emerging nanotechnologies is assessed using a generality index.

Keywords: Citation Analysis, Field, General Purpose Nanotechnology, Nanotechnologies, Nanotechnology, Patents, Science, Terms, US

? Levitt, J.M. and Thelwall, M. (2010), Does the higher citation of collaborative research differ from region to region? A case study of Economics. *Scientometrics*, **85** (1), 171-183.

Full Text: [2010\Scientometrics85, 171.pdf](2010/Scientometrics85,%20171.pdf)

Abstract: Many studies have found that collaborative research is, in general, more highly cited than non-collaborative research. This paper describes an investigation into the extent to which the association between high citation and collaboration for Economics articles published in 2000 varies from region to region and depends on the choice of indicator of citation level. Using data from the Social Science Citation Index (SSCI) for 18 countries, 17 American states and four indicators of citation level the citation levels of the collaborative articles are compared with the citation levels of the non-collaborative articles. The main findings are that: (a) for every country and every indicator the mean citation level of the collaborative articles was at least as high as that for the non-collaborative articles, but for five US states and for at least one other indicator the citation level of collaborative articles was lower than that of non-collaborative articles, and (b) the extent to which collaborative articles were more highly cited varied considerably from country to country, from state to state, and from indicator to indicator. This indicates the importance of using multiple indicators when investigating citation advantage since the choice of indicator can change the results.

Keywords: Articles, Bibliometric Approach, Citation, Citation Analysis, Co-Authorship, Impact, International Collaboration, Publication, Relative Indicators, Research, Research Collaboration, Science, Scientific Collaboration, Self-Citations, Us

? Prathap, G. (2010), An iCE map approach to evaluate performance and efficiency of scientific production of countries. *Scientometrics*, **85** (1), 185-191.

Full Text: [2010\Scientometrics85, 185.pdf](2010/Scientometrics85,%20185.pdf)

Abstract: An indicator called the performance index (p-index) which can effectively combine size and quality of scientific papers, mocking what the h-index could do, emerges from an energy like term E = iC, where i is a measure of quality, expressed as the ratio of citations C to papers published P. In this paper, we demonstrate how this energy paradigm can be used for bibliometric research assessment. The energy assessment technique is demonstrated by applying it to the research assessment of all the countries listed in Essential Science Indicators. Partitioning is easily done by using contour lines on the two-dimensional iCE (impact-Citations-Energy) map.

Keywords: Bibliometric, Bibliometrics, E = IC, Efficiency, Energy-Index, h Index, h-Index, h-Index, Hirsch-Type Indexes, ICE Maps, P-Index, Performance, Quality, Quantity, Research

? Pautasso, M. (2010), Worsening file-drawer problem in the abstracts of natural, medical and social science databases. *Scientometrics*, **85** (1), 193-202.

Full Text: [2010\Scientometrics85, 193.pdf](2010/Scientometrics85,%20193.pdf)

Abstract: The file-drawer problem is the tendency of journals to preferentially publish studies with statistically significant results. The problem is an old one and has been documented in various fields, but to my best knowledge there has not been attention to how the issue is developing in a quantitative way through time. In the abstracts of various major scholarly databases (Science and Social Science Citation Index (1991-2008), CAB Abstracts and Medline (1970s-2008), the file drawer problem is gradually getting worse, in spite of an increase in (1) the total number of publications and (2) the proportion of publications reporting both the presence and the absence of significant differences. The trend is confirmed for particular natural science topics such as biology, energy and environment but not for papers retrieved with the keywords biodiversity, chemistry, computer, engineering, genetics, psychology and quantum (physics). A worsening file-drawer problem can be detected in various medical fields (infection, immunology, malaria, obesity, oncology and pharmacology), but not for papers indexed with strings such as AIDS/HIV, epidemiology, health and neurology. An increase in the selective publication of some results against some others is worrying because it can lead to enhanced bias in meta-analysis and hence to a distorted picture of the evidence for or against a certain hypothesis. Long-term monitoring of the file-drawer problem is needed to ensure a sustainable and reliable production of (peer-reviewed) scientific knowledge.

Keywords: Citation, Guide, History of Science, Manuscript, Meta-Analysis, Obesity, Psychiatry, Publication Bias, Publication Explosion, Scientific Knowledge, Significant Differences, STM Publishing, Tests

? Franceschini, F., Maisano, D., Perotti, A. and Proto, A. (2010), Analysis of the ch-index: an indicator to evaluate the diffusion of scientific research output by citers. *Scientometrics*, **85** (1), 203-217.

Full Text: [2010\Scientometrics85, 203.pdf](2010/Scientometrics85,%20203.pdf)

Abstract: This paper focuses the attention on the ch-index, a recent bibliometric indicator similar to the Hirsch (h) index, to evaluate the published research output of a scientist (Ajiferuke and Wolfram, Proceedings of the 12th international conference of the international society for scientometrics and informetrics. Rio de Janeiro, pp. 798-808, 2009). Ch-index is defined as the number such that, for a general group of scientific publications, ch publications are cited by at least ch different citers while the other publications are cited by no more than ch different citers. The basic difference from the classical h is that, according to ch, the diffusion of one author’s publication is evaluated on the basis of the number of different citing authors (or citers), rather than the number of received citations. The goal of this work is to discuss the pros and cons of ch and identify its connection with h. A large sample of scientists in the Quality Engineering/Management field are analyzed so as to investigate the novel indicator’s characteristics. Then, the analysis is preliminarily extended to other scientific disciplines. The most important result is that ch is almost insensitive to self-citations and/or citations made by recurrent citers, and it can be profitably used for complementing h.

Keywords: Author, Bibliometric, Bibliometric Indicators, Bibliometrics, Citations, Citers, Citing Authors, h-Index, Hirsch Index, Hirsch-Index, Impact, Journals, Quality, Recurrent Citers, Research, Science, Self-Citation, Self-Citations

? Velden, T., Haque, A. and Lagoze, C. (2010), A new approach to analyzing patterns of collaboration in co-authorship networks: Mesoscopic analysis and interpretation. *Scientometrics*, **85** (1), 219-242.

Full Text: [2010\Scientometrics85, 219.pdf](2010/Scientometrics85,%20219.pdf)

Abstract: This paper focuses on methods to study patterns of collaboration in co-authorship networks at the mesoscopic level. We combine qualitative methods (participant interviews) with quantitative methods (network analysis) and demonstrate the application and value of our approach in a case study comparing three research fields in chemistry. A mesoscopic level of analysis means that in addition to the basic analytic unit of the individual researcher as node in a co-author network, we base our analysis on the observed modular structure of co-author networks. We interpret the clustering of authors into groups as bibliometric footprints of the basic collective units of knowledge production in a research specialty. We find two types of coauthor-linking patterns between author clusters that we interpret as representing two different forms of cooperative behavior, transfer-type connections due to career migrations or one-off services rendered, and stronger, dedicated inter-group collaboration. Hence the generic coauthor network of a research specialty can be understood as the overlay of two distinct types of cooperative networks between groups of authors publishing in a research specialty. We show how our analytic approach exposes field specific differences in the social organization of research.

Keywords: Bibliometric, Chemistry, Co-Author Networks, Coauthorship, Community Structure, Complex Networks, Disciplines, Growth-Model, International Scientific Collaboration, Journal Literature, Manifestation, Network Analysis, Productivity, Research, Science, Scientific Communication

? Aguillo, I.F., Bar-Ilan, J., Levene, M. and Ortega, J.L. (2010), Comparing university rankings. *Scientometrics*, **85** (1), 243-256.

Full Text: [2010\Scientometrics85, 243.pdf](2010/Scientometrics85,%20243.pdf)

Abstract: Recently there is increasing interest in university rankings. Annual rankings of world universities are published by QS for the Times Higher Education Supplement, the Shanghai Jiao Tong University, the Higher Education and Accreditation Council of Taiwan and rankings based on Web visibility by the Cybermetrics Lab at CSIC. In this paper we compare the rankings using a set of similarity measures. For the rankings that are being published for a number of years we also examine longitudinal patterns. The rankings limited to European universities are compared to the ranking of the Centre for Science and Technology Studies at Leiden University. The findings show that there are reasonable similarities between the rankings, even though each applies a different methodology. The biggest differences are between the rankings provided by the QS-Times Higher Education Supplement and the Ranking Web of the CSIC Cybermetrics Lab. The highest similarities were observed between the Taiwanese and the Leiden rankings from European universities. Overall the similarities are increased when the comparison is limited to the European universities.

Keywords: Bibliometric Methods, Comparative Analysis, Leiden Ranking, Ranking, Shanghai Ranking, Taiwan Ranking, Times Ranking, Universities, Webometrics Ranking

? Fu, L.D. and Aliferis, C.F. (2010), Using content-based and bibliometric features for machine learning models to predict citation counts in the biomedical literature. *Scientometrics*, **85** (1), 257-270.

Full Text: [2010\Scientometrics85, 257.pdf](2010/Scientometrics85,%20257.pdf)

Abstract: The most popular method for judging the impact of biomedical articles is citation count which is the number of citations received. The most significant limitation of citation count is that it cannot evaluate articles at the time of publication since citations accumulate over time. This work presents computer models that accurately predict citation counts of biomedical publications within a deep horizon of 10 years using only predictive information available at publication time. Our experiments show that it is indeed feasible to accurately predict future citation counts with a mixture of content-based and bibliometric features using machine learning methods. The models pave the way for practical prediction of the long-term impact of publication, and their statistical analysis provides greater insight into citation behavior.

Keywords: Bibliometric, Bibliometrics, Citation Analysis, Information Retrieval, Machine Learning, Text Categorization

? Gomez-Sancho, J.M. and Mancebon-Torrubia, M.J. (2010), A new approach to measuring scientific production in JCR journals and its application to Spanish public universities. *Scientometrics*, **85** (1), 271-293.

Full Text: [2010\Scientometrics85, 271.pdf](2010/Scientometrics85,%20271.pdf)

Abstract: Scientific production has been evaluated from very different perspectives, the best known of which are essentially based on the impact factors of the journals included in the Journal Citation Reports (JCR). This has been no impediment to the simultaneous issuing of warnings regarding the dangers of their indiscriminate use when making comparisons. This is because the biases incorporated in the elaboration of these impact factors produce significant distortions, which may invalidate the results obtained. Notable among such biases are those generated by the differences in the propensity to cite of the different areas, journals and/or authors, by variations in the period of materialisation of the impact and by the varying presence of knowledge areas in the sample of reviews contained in the JCR. While the traditional evaluation method consists of standardisation by subject categories, recent studies have criticised this approach and offered new possibilities for making inter-area comparisons. In view of such developments, the present study proposes a novel approach to the measurement of scientific activity, in an attempt to lessen the aforementioned biases. This approach consists of combining the employment of a new impact factor, calculated for each journal, with the grouping of the institutions under evaluation into homogeneous groups. An empirical application is undertaken to evaluate the scientific production of Spanish public universities in the year 2000. This application considers both the articles published in the multidisciplinary databases of the Web of Science (WoS) and the data concerning the journals contained in the Sciences and Social Sciences Editions of the Journal Citation Report (JCR). All this information is provided by the Institute of Scientific Information (ISI), via its Web of Knowledge (WoK).

Keywords: Accuracy, Citation, Citation Analysis, Cross-Field, Field-Normalization, Impact Factors, Indicators, ISI, Journal Impact Factor, Performance, Research Evaluation, Universities

? Bookstein, F.L., Seidler, H., Fieder, M. and Winckler, G. (2010), Too much noise in the Times Higher Education rankings. *Scientometrics*, **85** (1), 295-299.

Full Text: [2010\Scientometrics85, 295.pdf](2010/Scientometrics85,%20295.pdf)

Abstract: Several individual indicators from the Times Higher Education Survey (THES) data base-the overall score, the reported staff-to-student ratio, and the peer ratings-demonstrate unacceptably high fluctuation from year to year. The inappropriateness of the summary tabulations for assessing the majority of the “top 200” universities would be apparent purely for reason of this obvious statistical instability regardless of other grounds of criticism. There are far too many anomalies in the change scores of the various indices for them to be of use in the course of university management.

Keywords: Rankings, Statistical Noise, Times Higher Education Ranking

? Zyczkowski, K. (2010), Citation graph, weighted impact factors and performance indices. *Scientometrics*, **85** (1), 301-315.

Full Text: [2010\Scientometrics85, 201.pdf](2010/Scientometrics85,%20201.pdf)

Abstract: A scheme of evaluating an impact of a given scientific paper based on importance of papers quoting it is investigated. Introducing a weight of a given citation, dependent on the previous scientific achievements of the author of the citing paper, we define the weighting factor of a given scientist. Technically the weighting factors are defined by the components of the normalized leading eigenvector of the matrix describing the citation graph. The weighting factor of a given scientist, reflecting the scientific output of other researchers quoting his work, allows us to define weighted number of citation of a given paper, weighted impact factor of a journal and weighted Hirsch index of an individual scientist or of an entire scientific institution.

Keywords: Citation, Citation Graph, Citations, Eigenvector, Google, h-Index, Hirsch Index, Hirsch-Index, Pagerank, Performance Index, Science, Self-Citations, Weighted Bibliometric Indices

? Wiles, L., Olds, T. and Williams, M. (2010), Evidence base, quantitation and collaboration: three novel indices for bibliometric content analysis. *Scientometrics*, **85** (1), 317-328.

Full Text: [2010\Scientometrics85, 317.pdf](2010/Scientometrics85,%20317.pdf)

Abstract: Bibliometric measurements, though controversial, are useful in providing measures of research performance in a climate of research competition and marketisation. Numerous bibliometric studies have been performed which rely on traditional indices (such as the journal impact factor and citation index) and provide little descriptive data regarding the actual characteristics of research. The purpose of this study was two-fold, to develop three novel bibliometric indices, designed to describe the characteristics of research (relating to evidence base, quantitation and collaboration), and to apply them in a cross-sectional audit of original research articles published in Australian professional association journals across medicine, nursing and allied health in 2007. Results revealed considerable variation in bibliometric indices across these journals. There were emerging clusters of journals that published collaborative research using higher levels of evidence and reported quantitative data, with others featuring articles using lower levels of evidence, fewer quantitative data and less collaboration among authors.

Keywords: Allied Health Occupations, Authorship, Bibliometric, Bibliometrics, Gender, Health Research, Medicine, Nursing Health Occupations, Professional Practice, Research

? Albarran, P., Crespo, J.A., Ortuno, I. and Ruiz-Castillo, J. (2010), A comparison of the scientific performance of the US and the European union at the turn of the 21st century. *Scientometrics*, **85** (1), 329-344.

Full Text: [2010\Scientometrics85, 329.pdf](2010/Scientometrics85,%20329.pdf)

Abstract: In this paper, scientific performance is identified with the impact that journal articles have through the citations they receive. In 15 disciplines, as well as in all sciences as a whole, the EU share of total publications is greater than that of the U.S. However, as soon as the citations received by these publications are taken into account the picture is completely reversed. Firstly, the EU share of total citations is still greater than the U.S. in only seven fields. Secondly, the mean citation rate in the U.S. is greater than in the EU in every one of the 22 fields studied. Thirdly, since standard indicators-such as normalized mean citation ratios-are silent about what takes place in different parts of the citation distribution, this paper compares the publication shares of the U.S. and the EU at every percentile of the world citation distribution in each field. It is found that in seven fields the initial gap between the U.S. and the EU widens as we advance towards the more cited articles, while in the remaining 15 fields-except for Agricultural Sciences-the U.S. always surpasses the EU when it counts, namely, at the upper tail of citation distributions. Finally, for all sciences as a whole the U.S. publication share becomes greater than that of the EU for the top 50% of the most highly cited articles. The data used refers to 3.6 million articles published in 1998-2002, and the more than 47 million citations they received in 1998-2007.

Keywords: Bibliometric Tools, Citation, Citation Analysis, European Paradox, Indicators, National Research Performance, Policy, Research Performance, Science-and-Technology, Scientific Ranking, US, World

? Lewison, G. and Turnbull, T. (2010), News in brief and features in New Scientist magazine and the biomedical research papers that they cite, August 2008 to July 2009. *Scientometrics*, **85** (1), 345-359.

Full Text: [2010\Scientometrics85, 345.pdf](2010/Scientometrics85,%20345.pdf)

Abstract: New Scientist is a British weekly magazine that is half-way between a newspaper and a scientific journal. It has many news items, and also longer feature articles, both of which cite biomedical research papers, and thus serve to make them better known to the public and to the scientific community, mainly in the UK but about half overseas. An analysis of these research papers shows (in relation to their presence in the biomedical research literature) a strong bias towards the UK, and also one to the USA, Scandinavia and Ireland. There is a reasonable spread of subject areas, although neuroscience is favoured, and coverage of many journals-not just the leading weeklies. Most of the feature articles (but not the news items) in New Scientist include comments by other researchers, who can put the new results in context. Their opinions appear to be more discriminating than those of commentators on research in the mass media, who usually enthuse over the results while counselling patience before a cure for the disease is widely available.

Keywords: Cancer, Cited Papers, Coverage, Health Research, Impact, Media, News Stories, Newspapers, Popular Science Writing, Press, Research, Risks, SARS

? Kaur, H. and Gupta, B.M. (2010), Mapping of dental science research in India: A scientometric analysis of India’s research output, 1999-2008. *Scientometrics*, **85** (1), 361-376.

Full Text: [2010\Scientometrics85, 361.pdf](2010/Scientometrics85,%20361.pdf)

Abstract: The study examines India’s performance based on its publication output in dental sciences during 1999-2008, based on several parameters, including the country annual average growth rate, global publication share & rank among 25 most productive countries of the world, national publication output and impact in terms of average citations per paper, international collaboration output and share and contribution of major collaborative partners, contribution and impact of select top 25 Indian institutions and select top 15 most productive authors, patterns of communication in national and international journals and characteristics of its 45 high cited papers. The study uses 10 years (1999-2008) publications data in dental sciences of India and other countries drawn from Scopus international multidisciplinary bibliographical database.

Keywords: Dental Citations, Dental Publications, Dental Research, Research, Scientometric Analysis

? Ortega, J.L. and Aguillo, I.F. (2010), Shaping the European research collaboration in the 6th Framework Programme health thematic area through network analysis. *Scientometrics*, **85** (1), 377-386.

Full Text: [2010\Scientometrics85, 377.pdf](2010/Scientometrics85,%20377.pdf)

Abstract: This paper aims to analyse the collaboration network of the 6th Framework Programme of the EU, specifically the “Life sciences, genomics and biotechnology for health” thematic area. A collaboration network of 2,132 participant organizations was built and several variables were added to improve the visualization such as type of organization and nationality. Several statistical tests and structural indicators were used to uncover the main characteristic of this collaboration network. Results show that the network is constituted by a dense core of government research organizations and universities which act as large hubs that attract new partners to the network, mainly companies and non-profit organizations.

Keywords: 6th Framework Programme, Biotechnology, Centrality, Emergence, Network Analysis, Research, Research Collaboration, Science, Scientometrics, Web

? Calver, M., Wardell-Johnson, G., Bradley, S. and Taplin, R. (2010), What makes a journal international? A case study using conservation biology journals. *Scientometrics*, **85** (2), 387-400.

Full Text: [2010\Scientometrics85, 387.pdf](2010/Scientometrics85,%20401.pdf)

Abstract: The qualitative label ‘international journal’ is used widely, including in national research quality assessments. We determined the practicability of analysing internationality quantitatively using 39 conservation biology journals, providing a single numeric index (IIJ) based on 10 variables covering the countries represented in the journals’ editorial boards, authors and authors citing the journals’ papers. A numerical taxonomic analysis refined the interpretation, revealing six categories of journals reflecting distinct international emphases not apparent from simple inspection of the IIJs alone. Categories correlated significantly with journals’ citation impact (measured by the Hirsch index), with their rankings under the Australian Commonwealth’s ‘Excellence in Research for Australia’ and with some countries of publication, but not with listing by ISI Web of Science. The assessments do not reflect on quality, but may aid editors planning distinctive journal profiles, or authors seeking appropriate outlets.

Keywords: Bibliometrics, Citation, Citation Studies, Conservation Biology, Hirsch Index, International Journal, ISI, Journal Ranking, Journals, Paper, Perspectives, Publication, Research

? Breimer, L.H. and Nilsson, T.K. (2010), A longitudinal and cross-sectional study of Swedish biomedical PhD processes 1991-2009 with emphasis on international and gender aspects. *Scientometrics*, **85** (2), 401-414.

Full Text: [2010\Scientometrics85, 401.pdf](2010/Scientometrics85,%20401.pdf)

Abstract: This longitudinal survey of Swedish biomedical PhDs from 1991 to 2009 found a 2.5-fold increase in biomedical PhD graduates, especially women, and mainly non-MDs, while the number of MDs remained fairly constant. The proportion obtaining a biomedical PhD in Sweden in 2006 was two and a half times that in USA compared to population and three and a half times by GDP, but similar to that of the Netherlands. Female non-MD but not female MD candidates were more likely than men to be examined by female examiners. Fewer of the non-MD than MD women continued to publish in English after their PhD. The median number of authors per paper in a thesis had increased by 1 (from 4 to 5) compared with 15-20 years ago. Swedish biomedical research was already well internationalized in 1991, when 38% of the external examiners came from abroad. This rose to 53% in 2003 but in 2009 had returned to 42%. USA and UK were the most common countries but Australia accounted for 2%. When assessed by connection with foreign research teams, Swedish researchers were also internationally well connected. Studies in other countries are needed to assess how generally applicable these findings are. Our findings suggest that the policy and management of Swedish scientific research systems needs revision to harmonize with the national economic capacity.

Keywords: Bibliometrics, Cross-Border Comparisons, Gender Issues, Higher Education Performance Indicators, Iternationalization of Research, PhD Process, Research, Researchers, Thesis

? Assimakis, N. and Adam, M. (2010), A new author’s productivity index: p-index. *Scientometrics*, **85** (2), 415-427.

Full Text: [2010\Scientometrics85, 415.pdf](2010/Scientometrics85,%20415.pdf)

Abstract: In this paper a new author’s productivity index is introduced, namely the golden productivity index. The proposed index measures the productivity of an individual researcher evaluating the number of papers as well as the rank of co-authorship. It provides an efficient method to measure the author’s contribution in articles writing, compared to other ordinary methods. It gives emphasis to the first authors contributions due to the fact that traditionally the rank of each author shows the magnitude of his contribution in the article.

Keywords: Articles, Author, Author Rank, Citation Measures, Co-Authorship, Coauthors, Collaboration, Contribution, Credit, Metrics, Multiple Authorship, Order, P-Index, Patterns, Productivity, Publication, Scientists

? Juznic, P., Peclin, S., Zaucer, M., Mandelj, T., Pusnik, M. and Demsar, F. (2010), Scientometric indicators: Peer-review, bibliometric methods and conflict of interests. *Scientometrics*, **85** (2), 429-441.

Full Text: [2010\Scientometrics85, 429.pdf](2010/Scientometrics85,%20429.pdf)

Abstract: The paper discusses the role of scientometric indicators in peer-review selection of research project proposals. An ex post facto evaluation was made of three calls for research project proposals in Slovenia: 2003 with a peer review system designed in a way that conflict of interest was not avoided effectively, 2005 with a sound international peer-review system with minimized conflict of interest influence but a limited number of reviewers, and 2008 with a combination of scientometric indicators and a sound international peer review with minimized conflict of interest influence. The hypothesis was that the three different peer review systems would have different correlations with the same set of scientometric indicators. In the last two decision-making systems (2005 and 2008) where conflict of interest was effectively avoided, we have a high percentage (65%) of projects that would have been selected in the call irrespective of the method (peer review or bibliometrics solely). In contrast, in the 2003 call there is a significantly smaller percentage (49%) of projects that would have been selected in the call irrespective of the method (peer review or bibliometrics solely). It was shown that while scientometric indicators can hardly replace the peer-review system as the ultimate decision-making and support system, they can reveal its weaknesses on one hand and on the other can verify peer-review scores and minimize conflict of interest if necessary.

Keywords: Bibliometric, Bibliometrics, Citation, Conflict Of Interests, Counts, Evaluation, EX Post Evaluation, Exercises, Impact, Peer Review Systems, Physics, Publications, Research, Research Project Proposals, Science Policy, Scientific Excellence, Scientometric Indicators, System

? Lancho-Barrantes, B.S., Guerrero-Bote, V.P. and Moya-Anegon, F. (2010), The iceberg hypothesis revisited. *Scientometrics*, **85** (2), 443-461.

Full Text: [2010\Scientometrics85, 443.pdf](2010/Scientometrics85,%20443.pdf)

Abstract: A study is described of the rank/JIF (Journal Impact Factor) distributions in the high-coverage Scopus database, using recent data and a three-year citation window. It includes a comparison with an older study of the Journal Citation Report categories and indicators, and a determination of the factors most influencing the distributions. While all the specific subject areas fit a negative logarithmic law fairly well, those with a greater External JIF have distributions with a more sharply defined peak and a longer tail-something like an iceberg. No S-shaped distributions, such as predicted by Egghe, were found. A strong correlation was observed between the knowledge export and import ratios. Finally, data from both Scopus and ISI were used to characterize the rank/JIF distributions by subject area.

Keywords: Categories, Citation, Citation Analysis, Fields, Impact Factor, ISI, Journal Impact Factor, Journal Impact Measures, Knowledge Export, Pathfinder, Science, Scientometrics

? Cho, C.C., Hu, M.W. and Liu, M.C. (2010), Improvements in productivity based on co-authorship: A case study of published articles in China. *Scientometrics*, **85** (2), 463-470.

Full Text: [2010\Scientometrics85, 463.pdf](2010/Scientometrics85,%20463.pdf)

Abstract: The issue of primary interest to this study is the collaboration that has taken place in science and technology (S&T) research in China. Due to our empirical evidences, the regions with higher relationship (network) capital enjoy higher knowledge productivity in terms of published articles. Our purpose in this paper is to investigate the relationships that exist between regional published articles and co-authorship in China covering the period from 1998 to 2007 by using Stata to investigate the relation between the regional publications and co-authored published articles. As main findings, the greater the number of co-authored articles that a region has, the greater their success, in terms of the number of articles published. Indeed, both domestic and international co-authorship have had positive effects on published article levels in China.

Keywords: Academic Research, Co-Authorship, Collaboration, Determinants, Economics, Journals, Knowledge, Knowledge Production Function, Publications, Regional Innovation Systems, Research, Science, Scientific Collaboration, Technology

? Haddow, G. and Genoni, P. (2010), Citation analysis and peer ranking of Australian social science journals. *Scientometrics*, **85** (2), 471-487.

Full Text: [2010\Scientometrics85, 471.pdf](2010/Scientometrics85,%20471.pdf)

Abstract: Citation analyses were performed for Australian social science journals to determine the differences between data drawn from Web of Science and Scopus. These data were compared with the tier rankings assigned by disciplinary groups to the journals for the purposes of a new research assessment model, Excellence in Research for Australia (ERA), due to be implemented in 2010. In addition, citation-based indicators including an extended journal impact factor, the h-index, and a modified journal diffusion factor, were calculated to assess whether subsequent analyses influence the ranking of journals. The findings suggest that the Scopus database provides higher number of citations for more of the journals. However, there appears to be very little association between the assigned tier ranking of journals and their rank derived from citations data. The implications for Australian social science researchers are discussed in relation to the use of citation analysis in the ERA.

Keywords: Australia, Citation, Citation Analysis, Citation Sources, Citations, Counts, Coverage, Diffusion, ERA, Google-Scholar, h Index, h-Index, Impact, Information, Journal Ranking, Journals, Research, Research Assessment, Research Assessment Exercise, Researchers, Science, Scopus, Social Science Journals, Web-of-Science

? De Marchi, M. and Rocchi, M. (2010), Note on R&D expenditures and fixed capital formation. *Scientometrics*, **85** (2), 489-494.

Full Text: [2010\Scientometrics85, 489.pdf](2010/Scientometrics85,%20489.pdf)

Abstract: In this paper we deal with the fixed capital nature of the means of production and labour employed in research and development which generate scientific and technological knowledge. We argue that these R&D current expenditures typically have the nature of fixed investments. We then present an empirical analysis which shows that expenditures on industrial R&D are more strongly linked to the formation of fixed capital than to the formation of capital in general. Applying this conclusion to the economics of research and innovation would make it possible to analyse investments in the production of scientific and technological knowledge with a higher degree of clarity and precision.

Keywords: Capital, Innovation, Production, Research

? Miguel, S., Moya-Anegon, F. and Herrero-Solana, V. (2010), The impact of the socio-economic crisis of 2001 on the scientific system of Argentina from the scientometric perspective. *Scientometrics*, **85** (2), 495-507.

Full Text: [2010\Scientometrics85, 495.pdf](2010/Scientometrics85,%20495.pdf)

Abstract: In recent years a number of studies have focused on Argentina’s 2001 economic crisis and its political, social, and institutional repercussions. To date, however, no studies have analyzed its effects upon the country’s scientific system from a scientometric perspective, in terms of resources dedicated to scientific activity and the final output and impact. The present study does so by means of a set of scientometric indicators that reflect economic effort, human resources dedicated to research, publications, collaborative relations, and the international visibility of scientific contributions.

Keywords: 2001, Argentina, Latin-America, Publications, Research, Scientific System, Scientometric Indicators, Socio-Economic Crisis

? Bolanos-Pizarro, M., Thijs, B. and Glänzel, W. (2010), Cardiovascular research in Spain. A comparative scientometric study. *Scientometrics*, **85** (2), 509-526.

Full Text: [2010\Scientometrics85, 509.pdf](2010/Scientometrics85,%20509.pdf)

Abstract: A bibliometric analysis of Spanish cardiovascular research is presented. The study focuses on the productivity, visibility and citation impact in an international, notably European context. Special attention is given to international collaboration. The underlying bibliographic data are collected from Thomson Reuters’s Web of Science on the basis of a ‘hybrid’ search strategy combining core journals, lexical terms and citation links especially developed for the field of cardiology.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Approach, Cardiovascular Research, Citation, Citations, Co-Authorship, Indicators, International Collaboration, International Scientific Collaboration, Journal Impact, Journals, Output, Research, Research Performance, Science, Spain

? Meyer, M., Debackere, K. and Glänzel, W. (2010), Can applied science be ‘good science’? Exploring the relationship between patent citations and citation impact in nanoscience. *Scientometrics*, **85** (2), 527-539.

Full Text: [2010\Scientometrics85, 527.pdf](2010/Scientometrics85,%20527.pdf)

Abstract: There is a rich literature on how science and technology are related to each other. Patent citation analysis is amongst the most frequently used to tool to track the strengths of links. In this paper we explore the relationship between patent citations and citation impact in nanoscience. Our observations indicate that patent-cited papers perform better in terms of standard bibliometric indicators than comparable publications that are not linked to technology in this way. More specifically, we found that articles cited in patents are more likely to be cited also by other papers. The share of highly cited papers is the most striking result. Instead of the average of 4% of all papers, 13.8% of the papers cited once or twice in patents fall into this category and even 23.5% of the papers more frequently cited in patents receive citation rates far above the standard. Our analyses further demonstrate the presence and the relevance of bandwagon effects driving the development of science and technology.

Keywords: Bibliometric, Citation, Citation Analysis, Citation Impact, Citations, Collaboration, Emerging Field, Exploration, Innovation, Interdisciplinarity, Nano-Science, Nanoscience, Nanotechnology, Nanotechnology, Patent, Patent Citations, Performance, Publications, Science, Science-Technology Linkage, Scientific Literature, Technology

? Jeong, S. and Kim, H.G. (2010), Intellectual structure of biomedical informatics reflected in scholarly events. *Scientometrics*, **85** (2), 541-551.

Full Text: [2010\Scientometrics85, 541.pdf](2010/Scientometrics85,%20541.pdf)

Abstract: The purpose of this paper was to analyze the intellectual structure of biomedical informatics reflected in scholarly events such as conferences, workshops, symposia, and seminars. As analysis variables, ‘call for paper topics’, ‘session titles’ and author keywords from biomedical informatics-related scholarly events, and the MeSH descriptors were combined. As analysis cases, the titles and abstracts of 12,536 papers presented at five medical informatics (MI) and six bioinformatics (BI) global scale scholarly event series during the years 1999-2008 were collected. Then, n-gram terms (MI = 6,958, BI = 5,436) from the paper corpus were extracted and the term co-occurrence network was analyzed. One hundred important topics for each medical informatics and bioinformatics were identified through the hub-authority metric, and their usage contexts were compared with the k-nearest neighbor measure. To research trends, newly popular topics by 2-year period units were observed. In the past 10 years the most important topic in MI has been “decision support”, while in BI “gene expression”. Though the two communities share several methodologies, according to our analysis, they do not use them in the same context. This evidence suggests that MI uses technologies for the improvement of productivity in clinical settings, while BI uses algorithms as its tools for scientific biological discovery. Though MI and BI are arguably separate research fields, their topics are increasingly intertwined, and the gap between the fields blurred, forming a broad informatics-namely biomedical informatics. Using scholarly events as data sources for domain analysis is the closest way to approximate the forefront of biomedical informatics.

Keywords: Author, Bibliometric Analysis, Bioinformatics, Biomedical Informatics, Biotechnology, Co-Word Analysis, Co-Word Analysis, Conference, Conferences, Exploratory Analysis, Field, Intellectual Structure, Medical Informatics, Research, Scholarly Event, Science, Social Network Analysis, Undiscovered Public Knowledge

? Perakakis, P., Taylor, M., Mazza, M. and Trachana, V. (2010), Natural selection of academic papers. *Scientometrics*, **85** (2), 553-559.

Full Text: [2010\Scientometrics85, 553.pdf](2010/Scientometrics85,%20553.pdf)

Abstract: Academic papers, like genes, code for ideas or technological innovations that structure and transform the scientific organism and consequently the society at large. Genes are subject to the process of natural selection which ensures that only the fittest survive and contribute to the phenotype of the organism. The process of selection of academic papers, however, is far from natural. Commercial for-profit publishing houses have taken control over the evaluation and access to scientific information with serious consequences for the dissemination and advancement of knowledge. Academic authors and librarians are reacting by developing an alternative publishing system based on free-access journals and self-archiving in institutional repositories and global disciplinary libraries. Despite the emergence of such trends, the journal monopoly, rather than the scientific community, is still in control of selecting papers and setting academic standards. Here we propose a dynamical and transparent peer review process, which we believe will accelerate the transition to a fully open and free-for-all science that will allow the natural selection of the fittest ideas.

Keywords: Academic Publishing, Ethics, Evaluation, Journals, Peer Review, Science

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Full Text: [2010\Scientometrics85, 561.pdf](2010/Scientometrics85,%20561.pdf)

Abstract: Recent research has shown that simple graphical representations of research performance can be obtained using two-dimensional maps based on impact (i) and citations (C). The product of impact and citations leads to an energy term (E). Indeed, using E as the third coordinate, three-dimensional landscape maps can be prepared. In this paper, instead of using the traditional impact factor and total citations received for journal evaluation, Article Influence(TM) and Eigenfactor(TM) are used as substitutes. Article Influence becomes a measure of quality (i.e. a proxy for impact factor) and Eigenfactor is a proxy for size/quantity (like citations) and taken together, the product is an energy-like term. This can be used to measure the influence/prestige of a journal. It is also possible to propose a p-factor (where p = E (1/3)) as an alternative measure of the prestige or prominence of a journal which plays the equivalent role of the h-index.

Keywords: Article Influence (TM), Citations, Eigenfactor, Eigenfactor (TM), Evaluation, h Index, h-Index, Impact Factor, Impact Factor, Journal Evaluation, P-Index, Research

? Hagen, N.T. (2010), Deconstructing doctoral dissertations: how many papers does it take to make a PhD? *Scientometrics*, **85** (2), 567-579.

Full Text: [2010\Scientometrics85, 567.pdf](2010/Scientometrics85,%20567.pdf)

Abstract: A collection of coauthored papers is the new norm for doctoral dissertations in the natural and biomedical sciences, yet there is no consensus on how to partition authorship credit between PhD candidates and their coauthors. Guidelines for PhD programs vary but tend to specify only a suggested range for the number of papers to be submitted for evaluation, sometimes supplemented with a requirement for the PhD candidate to be the principal author on the majority of submitted papers. Here I use harmonic counting to quantify the actual amount of authorship credit attributable to individual PhD graduates from two Scandinavian universities in 2008. Harmonic counting corrects for the inherent inflationary and equalizing biases of routine counting methods, thereby allowing the bibliometrically identifiable amount of authorship credit in approved dissertations to be analyzed with unprecedented accuracy. Unbiased partitioning of authorship credit between graduates and their coauthors provides a post hoc bibliometric measure of current PhD requirements, and sets a de facto baseline for the requisite scientific productivity of these contemporary PhD’s at a median value of approximately 1.6 undivided papers per dissertation. Comparison with previous census data suggests that the baseline has shifted over the past two decades as a result of a decrease in the number of submitted papers per candidate and an increase in the number of coauthors per paper. A simple solution to this shifting baseline syndrome would be to benchmark the amount of unbiased authorship credit deemed necessary for successful completion of a specific PhD program, and then monitor for departures from this level over time. Harmonic partitioning of authorship credit also facilitates cross-disciplinary and inter-institutional analysis of the scientific output from different PhD programs. Juxtaposing bibliometric benchmarks with current baselines may thus assist the development of harmonized guidelines and transparent transnational quality assurance procedures for doctoral programs by providing a robust and meaningful standard for further exploration of the causes of intra- and inter-institutional variation in the amount of unbiased authorship credit per dissertation.

Keywords: Author, Authorship Credit, Baseline, Benchmark, Bias, Bibliometric, Bibliometric Counting, Bibliometry, Ethics, Evaluation, Faculty-Student Collaborations, Graduate, Publication, Theses

? Shin, J.C. and Cummings, W.K. (2010), Multilevel analysis of academic publishing across disciplines: research preference, collaboration, and time on research. *Scientometrics*, **85** (2), 581-594.

Full Text: [2010\Scientometrics85, 581.pdf](2010/Scientometrics85,%20581.pdf)

Abstract: This study developed a multilevel model of academic publishing and tested the effects of several predictors on faculty publishing. In particular, the analysis paid special attention to faculty preference, time on research, research collaboration, and faculty discipline. The data we used for this study is the Changing Academic Professions (CAP) data which is the follow-up study of the Carnegie Foundation in 1992. The study found that faculty preference for research affects research publishing. In addition, faculty collaboration with international peers is a critical factor in academic publishing. While time spent on research is related to publishing, time spent on teaching does not have a conflicting effect on faculty research. In the institution level analysis, institutional goal-orientation and institutional mission were found to have effects on academic publishing. However, the principal determinants of academic publishing were found to lie at the individual faculty member level. For each of these findings, there are subtle differences by academic discipline.

Keywords: Academic Publication, Departments, Disciplinary Differences, Faculty Research Productivity, Gender, Higher-Education, Interdisciplinary, Research, Research Collaboration, Research Preference, Scientific Productivity, Teaching Effectiveness, Time on Research

? Shapira, P., Youtie, J. and Porter, A.L. (2010), The emergence of social science research on nanotechnology. *Scientometrics*, **85** (2), 595-611.

Full Text: [2010\Scientometrics85, 595.pdf](2010/Scientometrics85,%20595.pdf)

Abstract: This article examines the development of social science literature focused on the emerging area of nanotechnology. It is guided by the exploratory proposition that early social science work on emerging technologies will draw on science and engineering literature on the technology in question to frame its investigative activities, but as the technologies and societal investments in them progress, social scientists will increasingly develop and draw on their own body of literature. To address this proposition the authors create a database of nanotechnology-social science literature by merging articles from the Web of Science’s Social Science Citation Index and Arts and Humanities Citation Index with articles from Scopus. The resulting database comprises 308 records. The findings suggest that there are multiple dimensions of cited literature and that social science citations of other social scientists’ works have increased since 2005.

Keywords: Citation, Citations, Collaboration, Emerging Technologies, Interdisciplinarity, Nanoscience, Nanotechnology, Patterns, Publications, Research, Robots, Science, Science Citation Index, Scientometrics, Societal Implications, Technical Change, Technology, Trust, US

? Mingers, J. and Lipitakis, E.A.E.C. (2010), Counting the citations: A comparison of Web of Science and Google Scholar in the field of business and management. *Scientometrics*, **85** (2), 613-625.

Full Text: [2010\Scientometrics85, 613.pdf](2010/Scientometrics85,%20613.pdf)

Abstract: Assessing the quality of the knowledge produced by business and management academics is increasingly being metricated. Moreover, emphasis is being placed on the impact of the research rather than simply where it is published. The main metric for impact is the number of citations a paper receives. Traditionally this data has come from the ISI Web of Science but research has shown that this has poor coverage in the social sciences. A newer and different source for citations is Google Scholar. In this paper we compare the two on a dataset of over 4,600 publications from three UK Business Schools. The results show that Web of Science is indeed poor in the area of management and that Google Scholar, whilst somewhat unreliable, has a much better coverage. The conclusion is that Web of Science should not be used for measuring research impact in management.

Keywords: Citations, Databases, Google Scholar, h-Index, Impact, ISI, Journals, Publications, Research, Research Impact, Scopus, Web of Science

? Vieira, P.C. and Teixeira, A.A.C. (2010), Are finance, management, and marketing autonomous fields of scientific research? An analysis based on journal citations. *Scientometrics*, **85** (3), 627-646.

Full Text: [2010\Scientometrics85, 627.pdf](2010/Scientometrics85,%20627.pdf)

Abstract: Although there is considerable consensus that Finance, Management and Marketing are ‘science’, some debate remains with regard to whether these three areas comprise autonomous, organized and settled scientific fields of research. In this paper we aim to explore this issue by analyzing the occurrence of citations in the top-ranked journals in the areas of Finance, Management, and Marketing. We put forward a modified version of the model of science as a network, proposed by Klamer and Van Dalen (J Econ Methodol 9(2):289-315, 2002), and conclude that Finance is a ‘Relatively autonomous, organized and settled field of research’, whereas Management and (to a larger extent) Marketing are relatively non-autonomous and hybrid fields of research’. Complementary analysis based on sub-discipline rankings using the recursive methodology of Liebowitz and Palmer (J Econ Lit 22:77-88, 1984) confirms the results. In conclusions we briefly discuss the pertinence of Whitley’s (The intellectual and social organization of the sciences, 1984) theory for explaining cultural differences across these sub-disciplines based on its dimensions of scholarly practices, ‘mutual dependency’ and ‘task uncertainty’.

Keywords: Analysis, Autonomy, Citations, Co-Word Analysis, Communication, Departments, Economics Journals, Finance, Index, Journals, Management, Marketing, Nanotechnology, Network, Patterns, Quality, Relative Impacts, Research, Science

? Lopresti, R. (2010), Citation accuracy in environmental science journals. *Scientometrics*, **85** (3), 647-655.

Full Text: [2010\Scientometrics85, 647.pdf](2010/Scientometrics85,%20647.pdf)

Abstract: Citations in five leading environmental science journals were examined for accuracy. 24.41% of the 2,650 citations checked were found to contain errors. The largest category of errors was in the author field. Of the five journals Conservation Biology had the lowest percentage of citations with errors and Climatic Change had the highest. Of the citations with errors that could be checked in Web of Science, 18.18% of the errors caused a search for the cited article to fail. Citations containing electronic links had fewer errors than those without.

Keywords: Author, Citation, Citation Accuracy, Citation Errors, Citations, Environmental Journals, Journals, Science, Web of Science

? De Witte, K. and Rogge, N. (2010), To publish or not to publish? On the aggregation and drivers of research performance. *Scientometrics*, **85** (3), 657-680.

Full Text: [2010\Scientometrics85, 657.pdf](2010/Scientometrics85,%20657.pdf)

Abstract: This paper presents a methodology to aggregate multidimensional research output. Using a tailored version of the non-parametric Data Envelopment Analysis model, we account for the large heterogeneity in research output and the individual researcher preferences by endogenously weighting the various output dimensions. The approach offers three important advantages compared to the traditional approaches: (1) flexibility in the aggregation of different research outputs into an overall evaluation score, (2) a reduction of the impact of measurement errors and a-typical observations, and (3) a correction for the influences of a wide variety of factors outside the evaluated researcher’s control. As a result, research evaluations are more effective representations of actual research performance. The methodology is illustrated on a data set of all faculty members at a large polytechnic university in Belgium. The sample includes questionnaire items on the motivation and perception of the researcher. This allows us to explore whether motivation and background characteristics (such as age, gender, retention, etc.,) of the researchers explain variations in measured research performance.

Keywords: Academic Economists, Belgium, Composite Indicator, Composite Indicators, Conditional Efficiency, Data Envelopment Analysis, Data Envelopment Analysis, Evaluation, Higher Education, Nonparametric Frontier Models, Preferences, Publication Productivity, Research, Research Institutes, Research Output, Research Performance, Research Productivity, Researchers, Retention, Scientific Productivity, Scientometric Indicators, Teaching Effectiveness

? Bornmann, L. and Daniel, H.D. (2010), The validity of staff editors’ initial evaluations of manuscripts: A case study of Angewandte Chemie International Edition. *Scientometrics*, **85** (3), 681-687.

Full Text: [2010\Scientometrics85, 681.pdf](2010/Scientometrics85,%20681.pdf)

Abstract: This paper investigates the extent to which staff editors’ evaluations of submitted manuscripts-that is, internal evaluations carried out before external peer reviewing-are valid. To answer this question we utilized data on the manuscript reviewing process at the journal Angewandte Chemie International Edition. The results of this study indicate that the initial internal evaluations are valid. Further, it appears that external review is indispensable for the decision on the publication worthiness of manuscripts: (1) For the majority of submitted manuscripts, staff editors are uncertain about publication worthiness, (2) there is a statistically significant proportional difference in “Rejection” between the editors’ initial evaluation and the final editorial decision (after peer review), (3) three-quarters of the manuscripts that were rated negatively at the initial internal evaluation but accepted for publication after the peer review had far above-average citation counts.

Keywords: Articles, Citation, Citation Counts, Evaluation, Impact, Peer Review, Publication, Staff Editor’S Initial Evaluation, Validity

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Full Text: [2010\Scientometrics85, 689.pdf](2010/Scientometrics85,%20689.pdf)

Abstract: This study proposes an empirical way for determining probability of network tie formation between network actors. In social network analysis, it is a usual problem that information for determining whether or not a network tie should be formed is missing for some network actors, and thus network can only be partially constructed due to unavailability of information. This methodology proposed in this study is based on network actors’ similarities calculations by Vector-Space Model to calculate how possible network ties can be formed. Also, a threshold value of similarity for deciding whether or not a network tie should be generated is suggested in this study. Four ontology-based knowledge networks, with journal paper or research project as network actors, constructed previously are selected as the targets of this empirical study: (1) Technology Foresight Paper Network: 181 papers and 547 keywords, (2) Regional Innovation System Paper Network: 431 papers and 1165 keywords, (3) Global Sci-Tech Policy Paper Network: 548 papers and 1705 keywords, (4) Taiwan’s Sci-Tech Policy Project Network: 143 research projects and 213 keywords. The four empirical investigations allow a cut-off threshold value calculated by Vector-Space Model to be suggested for deciding the formation of network ties when network linkage information is unavailable.

Keywords: Analysis, Assessment, Co-Word Analysis, Cocitation Analysis, Cut-Off Value, Field, Innovation, Keyword, Knowledge Network, Maps, Network, Network Formation, Research, Retrieval, Scientometrics, Social Network, Strength, System, Technology Foresight, Tool, Vector-Space Model

? Abramo, G., D’Angelo, C.A. and Viel, F. (2010), Peer review research assessment: A sensitivity analysis of performance rankings to the share of research product evaluated. *Scientometrics*, **85** (3), 705-720.

Full Text: [2010\Scientometrics85, 705.pdf](2010/Scientometrics85,%20705.pdf)

Abstract: In national research assessment exercises that take the peer review approach, research organizations are evaluated on the basis of a subset of their scientific production. The dimension of the subset varies from nation to nation but is typically set as a proportional function of the number of researchers employed at each research organization. However, scientific fertility varies from discipline to discipline, meaning that the representativeness of such a subset also varies according to discipline. The rankings resulting from the assessments could be quite sensitive to the size of the share of articles selected for evaluation. The current work examines this issue, developing empirical evidence of variations in ranking due changes in the dimension of the subset of products evaluated. The field of observation is represented by the scientific production from the hard sciences of the entire Italian university system, from 2001 to 2003.

Keywords: 2001, Analysis, Bibliometrics, Evaluation, Italy, Peer Review, Peer-Review, Production, Rankings, Research, Research Assessment Exercise, Researchers, Universities

? Taramasco, C., Cointet, J.P. and Roth, C. (2010), Academic team formation as evolving hypergraphs. *Scientometrics*, **85** (3), 721-740.

Full Text: [2010\Scientometrics85, 721.pdf](2010/Scientometrics85,%20721.pdf)

Abstract: This paper quantitatively explores the social and socio-semantic patterns of constitution of academic collaboration teams. To this end, we broadly underline two critical features of social networks of knowledge-based collaboration: first, they essentially consist of group-level interactions which call for team-centered approaches. Formally, this induces the use of hypergraphs and n-adic interactions, rather than traditional dyadic frameworks of interaction such as graphs, binding only pairs of agents. Second, we advocate the joint consideration of structural and semantic features, as collaborations are allegedly constrained by both of them. Considering these provisions, we propose a framework which principally enables us to empirically test a series of hypotheses related to academic team formation patterns. In particular, we exhibit and characterize the influence of an implicit group structure driving recurrent team formation processes. On the whole, innovative production does not appear to be correlated with more original teams, while a polarization appears between groups composed of experts only or non-experts only, altogether corresponding to collectives with a high rate of repeated interactions.

Keywords: Cohesion, Communities, Epistemic Dynamics Social Cohesion, Hypergraphs, Mechanisms, Network Structure, Performance, Perspective, Production, Research Collaboration, Science, Scientific Collaboration, Self-Organization, Social Network, Social Network Analysis, Social Networks, Socio-Semantic Networks, Team Formation

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Full Text: [2010\Scientometrics85, 741.pdf](2010/Scientometrics85,%20741.pdf)

Abstract: I propose the index (h) over bar (“hbar”), defined as the number of papers of an individual that have citation count larger than or equal to the (h) over barh of all coauthors of each paper, as a useful index to characterize the scientific output of a researcher that takes into account the effect of multiple authorship. The bar is higher for (h) over bar.

Keywords: (h)Over-Bar, (h)Over-Bar-Core, Authorship, Citation, Citations, Coauthors, Coauthorship, h-Core, h-Index, h-Index, Hirsch-Index, Impact, Individual Achievement, Proposal, Research, Research Output, Self-Consistency

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Full Text: [2010\Scientometrics85, 755.pdf](2010/Scientometrics85,%20755.pdf)

Abstract: Over the past 30 years, the research behavior of Chinese scholars has continually evolved. This paper studied the citing behavior of Chinese scholars by employing three indicators of citation concentration from the perspective of citation breadth analysis. All the citations from 2,338,033 papers from the Chinese Citation Database (1979-2008) covering four disciplines-Chemistry, Clinical Medicine, Library, Information and Archival Science, and Chinese Literature and World Literature-were analyzed. Empirical results show a general weakening tendency towards citation concentration: (1) decreasing percentage of uncited published papers within a given year, (2) a higher percentage of papers required to account for the same proportion of citation than before, and (3) the steady decline in the Herfindahl-Hirschman index (HHI) of citation distribution. All three measures indicate a decline in citing concentration or an increase in citation breadth. This phenomenon may be the result of increased access to materials, perhaps because of the ease with which scholarly materials can be accessed through the Internet.

Keywords: Analysis, Bibliometrics, China, Citation, Citations, Citations Analysis, Citing Behavior, Medicine, Reform and Opening up, Research, Science, Scientific Publications, Uncitedness, Web

? Feeney, M.K. and Bernal, M. (2010), Women in STEM networks: Who seeks advice and support from women scientists? *Scientometrics*, **85** (3), 767-790.

Full Text: [2010\Scientometrics85, 767.pdf](2010/Scientometrics85,%20767.pdf)

Abstract: Supporting and advancing women’s science careers continues to be of interest to researchers, scientists, science funders, and universities. Similarly, professional advice and support networks are important to understanding the advancement of scientific careers. This research aims to marry these two lines of research to investigate and compare the ways in which men and women scientists seek advice and support from women in their networks. Using a sample of academic scientists in nonmedical biology, chemistry, computer science, earth and atmospheric sciences, electrical engineering, and physics we assess the extent to which women and men scientists seek advice and support from women in their networks. We find that field of science is the primary predictor for the presence of women in scientists’ advice and support networks. We also find that citizenship, rank, age, and friendship are significantly related to the proportion of women in women’s networks, but are not consistently significantly related to the proportion of women in men’s networks. We conclude with a discussion of the findings and the distinctions between men and women scientists’ advice and support networks.

Keywords: Advice, American Academic Science, Critical Mass, Dilemmas, Field of Science, Networks, Overcoming Isolation, Paradox, Research, Researchers, Science, Size, Support, Women

? Collazo-Reyes, F., Luna-Morales, M.E., Russell, J.M. and Perez-Angon, M.A. (2010), Enriching knowledge production patterns of Mexican physics in particles and fields. *Scientometrics*, **85** (3), 791-802.

Full Text: [2010\Scientometrics85, 791.pdf](2010/Scientometrics85,%20791.pdf)

Abstract: A detailed analysis of the research carried out in Mexico in the physics specialty of particles and fields (MPPF) reveals the way the current production and citation patterns evolved over a period of 60 years. The basis for the analysis were the publications and citations registered in the Stanford Public Information REtrieval System-High Energy Physics (SPIRES) from 1970 to 2007. The historical coverage afforded by the Science Citation Index provided supplementary data from 1948 to 1979. Papers were classified into five research types: theoretical, phenomenological, experimental, cosmological, and other, while citations were identified as coming from: published or unpublished sources. Results show that the development of MPPF emerged from traditional theoretical and phenomenological research and that the most notable changes taking place in production and impact are associated with the community’s involvement in more productive and more internationally visible research practices, characteristic of large international collaborations, leaders in experimental physics and in the authorship of review papers.

Keywords: Analysis, Authorship, Big Science, Citation, Citations, Impact, Mexican Physics, Physics Particles and Fields, Production, Publications, Research, Science, Science Citation Index, Scientific Communication Patterns, Scientific Production

? Yoon, B., Lee, S. and Lee, G. (2010), Development and application of a keyword-based knowledge map for effective R&D planning. *Scientometrics*, **85** (3), 803-820.

Full Text: [2010\Scientometrics85, 803.pdf](2010/Scientometrics85,%20803.pdf)

Abstract: With the growing recognition of the importance of knowledge creation, knowledge maps are being regarded as a critical tool for successful knowledge management. However, the various methods of developing knowledge maps mostly depend on unsystematic processes and the judgment of domain experts with a wide range of untapped information. Thus, this research aims to propose a new approach to generate knowledge maps by mining document databases that have hardly been examined, thereby enabling an automatic development process and the extraction of significant implications from the maps. To this end, the accepted research proposal database of the Korea Research Foundation (KRF), which includes a huge knowledge repository of research, is investigated for inducing a keyword-based knowledge map. During the developmental process, text mining plays an important role in extracting meaningful information from documents, and network analysis is applied to visualize the relations between research categories and measure the value of network indices. Five types of knowledge maps (core R&D map, R&D trend map, R&D concentration map, R&D relation map, and R&D cluster map) are developed to explore the main research themes, monitor research trends, discover relations between R&D areas, regions, and universities, and derive clusters of research categories. The results can be used to establish a policy to support promising R&D areas and devise a long-term research plan.

Keywords: Analysis, Bibliometric Methods, Foresight Exercises, Knowledge Map, Network, Network Analysis, Networks, R&D, Research, Research Proposal Database, Science, Text Mining, Trend, Universities

? Ronda-Pupo, G.A. and Guerras-Martin, L.A. (2010), Dynamics of the scientific community network within the strategic management field through the *Strategic Management Journal* 1980-2009: the role of cooperation. *Scientometrics*, **85** (3), 821-848.

Full Text: [2010\Scientometrics85, 821.pdf](2010/Scientometrics85,%20821.pdf)

Abstract: The paper presents the dynamics of the strategic management scientific community network during knowledge creation and dissemination through the Strategic Management Journal from 1980 to 2009. The paper describes the evolution of the participant countries’ position within the network structure. We present the different stages that the network goes through, the vertices’ transformation into nodes and hubs, and the statistical significance level of cooperation between the country in the core position and the countries in the semi-periphery and periphery positions during their evolution and growth.

Keywords: Alliances, Business Policy, Co-Word Analysis, Collaboration, Intellectual Structure, Knowledge, Knowledge Creation and Dissemination, Management, Network, Representations, Science Maps, Scientific Community Network, Strategic Management, Strategic Management Journal, Virtual Community

? Fatt, C.K., bu Ujum, E. and Ratnavelu, K. (2010), The structure of collaboration in the *Journal of Finance*. *Scientometrics*, **85** (3), 849-860.

Full Text: [2010\Scientometrics85, 849.pdf](2010/Scientometrics85,%20849.pdf)

Abstract: This paper studies the structure of collaboration in the Journal of Finance for the period 1980-2009 using publication data from the Social Sciences Citation Index (SSCI). There are 3,840 publications within this period, out of which 58% are collaborations. These collaborations form 405 components, with the giant component capturing approximately 54% of total coauthors (it is estimated that the upper limit of distinct JF coauthors is 2,536, obtained from the total number of distinct author keywords found within the study period). In comparison, the second largest component has only 13 members. The giant component has mean degree 3 and average distance 8.2. It exhibits power-law scaling with exponent alpha = 3.5 for vertices with degree a parts per thousand yen5. Based on the giant component, the degree, closeness and betweenness centralization score, as well as the hubs/authorities score is determined. The findings indicate that the most important vertex on the giant component coincides with Sheridan Titman based on his top ten ranking on all four scores.

Keywords: Author, Centrality, Citation, Co-Authorship, Coauthors, Collaboration, Finance, Network Structure, Networks, Publication, Publications, Scientific Collaboration, Web

? Vinkler, P. (2010), Indicators are the essence of scientometrics and bibliometrics. *Scientometrics*, **85** (3), 861-866

Full Text: [2010\Scientometrics85, 861.pdf](2010/Scientometrics85,%20861.pdf)

Keywords: Bibliometrics, Credit, Impact, Indexes, Model, Performance, Science, Scientometrics

? Zhang, J.A., Vogeley, M.S. and Chen, C.M. (2011), Scientometrics of big science: a case study of research in the Sloan Digital Sky Survey. *Scientometrics*, **86** (1), 1-14.

Full Text: [2011\Scientometrics86, 1.pdf](2011/Scientometrics86,%201.pdf)

Abstract: Large-scale scientific projects have become a major impetus of scientific advances. But few studies have specifically analyzed how those projects bolster scientific research. We address this question from a scientometrics perspective. By analyzing the bibliographic records of papers relevant to the Sloan Digital Sky Survey (SDSS), we found that the SDSS helped scientists from many countries further develop their own research, investigators initially formed large research groups to tackle key problems, while later papers involved fewer authors, and the number of research topics increased but the diversity of topics remains stable. Furthermore, the entropy analysis method has proven valuable in terms of analyzing patterns of research topics at a macroscopic level.

Keywords: Analysis, Astronomical Publications, Bibliometric, Entropy Analysis, Large-Scale Scientific Project, Publication Analysis, Research, Research Topics, Science, Scientific Research, Scientometrics, Sloan Digital Sky Survey, Trends

? Maghrebi, M., Abbasi, A., Amiri, S., Monsefi, R. and Harati, A. (2011), A collective and abridged lexical query for delineation of nanotechnology publications. *Scientometrics*, **86** (1), 15-25.

Full Text: [2011\Scientometrics86, 15.pdf](2011/Scientometrics86,%2015.pdf)

Abstract: In order to monitor articles/patents in nanotechnology, there is little agreement on a universal lexical query or even an explicit definition of nanotechnology. Here in the light of a proposed definition, a set of case studies has been conducted to remove keywords which are not exclusive to nanotechnology. This resulted in a collective and abridged lexical query (CALQ) for nanotechnology delineation. Through bibliometric quantification of already-proposed as well as the novel keywords, it was shown that all keywords included in CALQ have considerable exclusive retrieval and precision, while the removed keywords do not satisfy either of these numerical thresholds. This approach may also be applied for the future updating of CALQ.

Keywords: Bibliometric, Bibliometric Study, Delineation, Field, Lexical Query, Light, Nanomedicine, Nanotechnology, Patents, Publications

? Mendlowicz, M.V., Coutinho, E.S.F., Laks, J., Fontenelle, L.F., Valenca, A.M., Berger, W., Figueira, I. and de Aguiar, G.A. (2011), Is there a ‘gender gap’ in authorship of the main Brazilian psychiatric journals at the beginning of the 21st century? *Scientometrics*, **86** (1), 27-37.

Full Text: [2011\Scientometrics86, 27.pdf](2011/Scientometrics86,%2027.pdf)

Abstract: The aim of this study was to investigate the existence of a “gender gap” in the authorship of the four most important peer-reviewed psychiatric journals in Brazil and to quantify its magnitude. In addition, we examined the patterns of change in this gap during the period extending from 2001 to 2008 and variations according to the total number of authors, the type of article (original vs. non-original studies), and the journals themselves. A total of 1,036 articles were analyzed. We found that the proportion of female overall participation has increased from 2001 to 2008. Nevertheless, the incremental rate was accounted mostly by the growth of the participation in non-original articles. While the average annual increment for original articles was virtually null (.01%), for the non-original articles the corresponding figure was 3.7%. We also found that the chance of a woman being first author was about three times greater in original papers as compared to non-original ones at the beginning of the study period, this differential declined by 11% per year during this period. A different pattern emerged from the analysis of female last authorship. Year of publication and type of study were still associated with the chance of a woman being the last author but without interaction. Further, the journals themselves were found to be related with female last authorship: the chance of a woman being the last author in an article published in the Revista Brasileira de Psiquiatria was significantly smaller than in the other three journals. Our findings indicate clearly that some progress in being achieved in eliminating the gender gap also in field of Psychiatry and highlight the need for further research in this area.

Keywords: 2001, 3 Decades, Analysis, Author, Authorship, Bibliometrics, Brazil, Female Authorship, Field, Gender Gap, Growth, Journals, Mental-Health, Number Of Authors, Psychiatry, Publication, Publications, Research, Science, Scientific Production, Scientometrics, Women

? Martinez, C. (2011), Patent families: When do different definitions really matter? *Scientometrics*, **86** (1), 39-63.

Full Text: [2011\Scientometrics86, 39.pdf](2011/Scientometrics86,%2039.pdf)

Abstract: Data on patent families is used in economic and statistical studies for many purposes, including the analysis of patenting strategies of applicants, the monitoring of the globalization of inventions and the comparison of the inventive performance and stock of technological knowledge of different countries. Most of these studies take family data as given, as a sort of black box, without going into the details of their underlying methodologies and patent linkages. However, different definitions of patent families may lead to different results. One of the purposes of this paper is to compare the most commonly used definitions of patent families and identify factors causing differences in family outcomes. Another objective is to shed light into the internal structure of patent families and see how it affects patent family outcomes based on different definitions. An automated characterization of the internal structures of all extended families with earliest priorities in the 1990s, as recorded in PATSTAT, found that family counts are not affected by the choice of patent family definitions in 75% of families. However, different definitions may really matter for the 25% of families with complex structures and lead to different family compositions, which might have an impact, for instance, on econometric studies using family size as a proxy of patent value.

Keywords: Analysis, Characterization, Comparison, Complex, Data, Family, Globalization, Impact, Lead, Light, Monitoring, Patent, Patent Equivalents, Patent Families, Patent Value, Performance, Priorities

? Jang, S.L. and Chen, J.H. (2011), What determines how long an innovative spell will last? *Scientometrics*, **86** (1), 65-76.

Full Text: [2011\Scientometrics86, 65.pdf](2011/Scientometrics86,%2065.pdf)

Abstract: This paper is set out to examine the temporal pattern of innovative activities: what might have affected a firm’s patenting from one period to the next. Based upon data on ‘information technology’ (IT) manufacturing firms in Taiwan covering the years 1990-2001, we develop a survival model to analyze the underlying drivers of patenting duration. Our results indicate that the level of the patent stock at the onset of the patent spell, defined as the number of successive years during which a firm produced at least one patent per year, has a non-linear effect on spell duration. Other factors, such as industrial growth, firm size and firm profitability, have a positive effect on patenting duration, while firm age and spell sequence affect negatively to spell duration. We conclude that state dependence is demonstrated by innovative behavior, yet the advantages gained from such creative accumulation can easily be dissipated, thereby illustrating the transient nature of dynamic capabilities.

Keywords: Countries, Data, Duration, Firms, Growth, Industrial, Information Technology, Innovative Persistence, Model, Patent, Patent Spell Longevity, Persistence, State Dependence, Survival, Taiwan, Technology, Technology Accumulation

? Docampo, D. (2011), On using the Shanghai ranking to assess the research performance of university systems. *Scientometrics*, **86** (1), 77-92.

Full Text: [2011\Scientometrics86, 77.pdf](2011/Scientometrics86,%2077.pdf)

Abstract: We take a new look at the Shanghai Jiao Tong Academic Ranking of World Universities to evaluate the performance of whole university systems. We deal with system aggregates by means of averaging scores taken over a number of institutions from each higher education system according to the Gross Domestic Product of its country. We treat the set of indicators (measures) at the country level as a scale, and investigate its reliability and dimensionality using appropriate statistical tools. After a Principal Component Analysis is performed, a clear picture emerges: at the aggregate level ARWU seems to be a very reliable one-dimensional scale, with a first component that explains more than 72% of the variance of the sample under analysis. The percentages of variance of the indicators explained by the first component do shed light on the fact that ARWU is in fact measuring the research quality (both at the individual and collective levels) of a university system. When the second principal component is taken into account, the two principal components contribute to explain more than 90% of the variance. The rotated solution facilitates the interpretation of the components and provides clear and interesting clustering information about the 32 higher education systems under analysis.

Keywords: Analysis, Clustering, Education, Indicators, Light, PCA, Performance, Ranking, Reliability, Research, Research Performance, Scale, Shanghai, Shanghai Ranking, System, Universities, University System

? Bornmann, L., Neuhaus, C. and Daniel, H.D. (2011), The effect of a two-stage publication process on the Journal Impact Factor: A case study on the interactive open access journal Atmospheric Chemistry and Physics. *Scientometrics*, **86** (1), 93-97.

Full Text: [2011\Scientometrics86, 93.pdf](2011/Scientometrics86,%2093.pdf)

Abstract: Taking the interactive open access journal Atmospheric Chemistry and Physics as an example, this study examines whether Thomson Reuters, for the Journal Citation Reports, correctly calculates the Journal Impact Factor (JIF) of a journal that publishes several versions of a manuscript within a two-stage publication process. The results of this study show that the JIF of the journal is not overestimated through the two-stage publication process.

Keywords: Angewandte-Chemie, Chemistry, Citation, Citations, Impact Factor, Impact-Factor, Index, Indicators, Journal, Journal Citation Reports, Journal Impact Factor, Misuse, Open Access, Peer Review, Process, Publication, Reports, Science

? Waaijer, C.J.F., van Bochove, C.A. and van Eck, N.J. (2011), On the map: Nature and Science editorials. *Scientometrics*, **86** (1), 99-112.

Full Text: [2011\Scientometrics86, 99.pdf](2011/Scientometrics86,%2099.pdf)

Abstract: Bibliometric mapping of scientific articles based on keywords and technical terms in abstracts is now frequently used to chart scientific fields. In contrast, no significant mapping has been applied to the full texts of non-specialist documents. Editorials in Nature and Science are such non-specialist documents, reflecting the views of the two most read scientific journals on science, technology and policy issues. We use the VOSviewer mapping software to chart the topics of these editorials. A term map and a document map are constructed and clusters are distinguished in both of them. The validity of the document clustering is verified by a manual analysis of a sample of the editorials. This analysis confirms the homogeneity of the clusters obtained by mapping and augments the latter with further detail. As a result, the analysis provides reliable information on the distribution of the editorials over topics, and on differences between the journals. The most striking difference is that Nature devotes more attention to internal science policy issues and Science more to the political influence of scientists.

Keywords: Analysis, Bibliometric, Bibliometrics, Classification, Clustering, Cocitation Analysis, Document Clustering, Editorials, Full-Text, Information-Science, Journals, Mapping, Science, Scientific Journals, Software, Technology, Vosviewer

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Full Text: [2011\Scientometrics86, 113.pdf](2011/Scientometrics86,%20113.pdf)

Abstract: This paper presents and discusses a new bibliometric indicator of research performance, designed with the fundamental concern of enabling cross-disciplinary comparisons. The indicator, called x-index, compares a researcher’s output to a reference set of research output from top researchers, identified in the journals where the researcher has published. It reflects publication quantity and quality, uses a moderately sized data set, and works with a more refined definition of scientific fields. x-index was developed to rank researchers in a scientific excellence award in the Faculty of Engineering of the University of Porto. The data set collected for the 2009 edition of the award is used to study the indicator’s features and design choices, and provides the basis for a discussion of its advantages and limitations.

Keywords: Bibliometric, Bibliometric Indicators, Cross-Disciplinarity, Data, Impact, Index, Individuals, Journals, Output, Performance, Publication, Rankings, Research, Research Output, Research Performance, Researchers

? Bouabid, H., Dalimi, M. and ElMajid, Z. (2011), Impact evaluation of the voluntary early retirement policy on research and technology outputs of the faculties of science in Morocco. *Scientometrics*, **86** (1), 125-132.

Full Text: [2011\Scientometrics86, 125.pdf](2011/Scientometrics86,%20125.pdf)

Abstract: Scientometric indicators or science metrics, conventional and derived ones, are used in ex-post evaluating of a government policy with impact on research system. Publications, citations, h-index, Glänzel model, and patents are applied in both micro and meso levels. This provides useful insight into the impact of the voluntary early retirement policy on research and technological outputs of the faculties of science in Morocco and consequently on the overall Morocco’s research system. The use of these metrics showed that the effect of the initiative was quite limited by affecting an average of 8% of the professor staffs of these institutions. Furthermore, each professor benefiting from this initiative had produced an average of 3.7 publications indexed in SCI in all his (her) career. The few number of the publications attributed to these professors had been gradually decreasing even 6 years before the initiative. No specific scientific field had intensively been struck. The findings also support that these professors were in general more ‘author’ than ‘inventor’. Inventor-professor institutions were likely more affected by the initiative. By means of these metrics, even if the initiative had not contributed to rejuvenate the professor-staffs of the faculties of science in Morocco, would nevertheless be a stimulus of their research system with respect to their scientometric indicators.

Keywords: Author, Chemistry, Citations, Evaluation, Field, H Index, H-Index, Hirsch-Index, Impact, Indicators, Metrics, Model, Morocco, Patent, Patents, Professors, Public Policy, Publication, Publications, Research, Research And Technology Outputs, Sci, Science, Scientific Field, Scientists, Scientometric Indicators, Support, System, Technology

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Full Text: [2011\Scientometrics86, 133.pdf](2011/Scientometrics86,%20133.pdf)

Abstract: The paper has the general aim of assessing the worldwide research activity in agricultural and food science and technology as it is reflected by the mainstream journal literature. The specific research questions were as follows: (1) What is the position of the European Research Area (ERA) represented by 33 countries in this study, on the world map of agrifood science publications? (2) Which countries are influential and what is their position? (3) Are there any specific European strengths and weaknesses by subfields of agrifood science? Overall, assessed by the total number of publications, the European Research Area (ERA), represented by 33 countries in this study, is in a dominant position on the world map of agrifood science. However, agrifood publications from the United States are more influential (judged by the average citation rates per paper). Correlation has been found between economic power and agrifood science publications: this is true not only for the total number of papers, but also for influence (measured by, again, the citation rates). Within Europe, the UK, Germany, France, Spain and the Netherlands dominate the agrifood research fields also in terms of citations. The Scandinavian countries, the Benelux states and Switzerland manage to produce influential papers across several fields of agrifood science. The EU’s New Member States-a populous area-together have less than 10% share in Europe’s agrifood publications and in citations they account for a 3-4% portion only. It seems that deepening of the integration of the national research systems in the European Research Area is desirable to have more impact of European agrifood research viewed from a global perspective.

Keywords: Activity, Agricultural-Research, Agriculture, Citation, Citation Analysis, Citation Rates, Citations, Era, Europe, European Union, Food Science, Food-Science, Germany, Impact, Journal, Literature, Number Of Publications, Publication, Publication Analysis, Publications, Research, Science, Science and Technology, Scientific Production, Spain, Switzerland, Technology, UK

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Full Text: [2011\Scientometrics86, 155.pdf](2011/Scientometrics86,%20155.pdf)

Abstract: This paper presents a proposal of CERIF data model extension for evaluation of scientific research results. The data model extension is based on the CERIF semantic layer which enables classification of entities and relations between entities according to some classification scheme. The proposed data model was created using PowerDesigner CASE tool. The model is represented using a physical data model in the conceptual notation that is adopted in literature for representing the CERIF data model. This model is verified using the rule book for evaluation and quantitative expression of scientific research results of researchers employed at University of Novi Sad.

Keywords: Bibliographic Records, Bibliometrics, Cerif, Consequences, Data, Data Model Extension, Evaluation, Evaluation Of Scientific Research Results, Informetrics, Library Circulation System, Literature, Marc 21, Model, Research, Researchers, Science, Scientific Research, Scientometrics, Unimarc, XML Editor

? Bornmann, L. (2011), Mimicry in science? *Scientometrics*, **86** (1), 173-177.

Full Text: [2011\Scientometrics86, 173.pdf](2011/Scientometrics86,%20173.pdf)

Abstract: Since bibliometric indicators have obtained a general acceptance in science policy and attained applied relevance in research evaluation, feedback effects on scientists’ behaviour resulting from the use of these indicators for science funding decisions have been reported. These adaptation strategies could be called mimicry in science. Scientists apply strategies that should enable them to comply to bibliometric accountability and to secure funds to their own research.

Keywords: Adaptation, Bibliometric, Bibliometric Indicators, Evaluation, Impact, Indicators, Mimicry, Publication, Quality, Research, Research Evaluation, Science, Scientific Progress, Spanish Research

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Full Text: [2011\Scientometrics86, 179.pdf](2011/Scientometrics86,%20179.pdf)

Abstract: This paper presents a bibliometric analysis of the literature published in the field of mathematics from 1868 to date. The data originate from the Zentralblatt MATH database. The increase rate of publications per year reflects the growth of the mathematics community and both can well be represented by exponential or linear functions, the latter especially after the Second World War. The distribution of publications follows Bradford’s law but in contrast to many other disciplines there is no strong domination of a small number of journals. The productivity of authors follows two inverse power laws of the Lotka form with different parameters, one in the range of low productivity and the other in the range of high productivity. The average productivity has changed only slightly since the year 1870. As far as multiple authorship is concerned the distribution of the number of authors per publication can be described quite well by a Gamma Distribution. The average number of authors per publication has been increasing steadily, while it was close to 1 up to the first quarter of the last century it has now reached a value of 2 in the last few years. This means that the percentage of single-authored papers has fallen from over 95% in the years before 1930 to about 30% today.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Collaboration, Data, Database, Distribution, Field, Growth, Journals, Literature, Mathematics, Number of Authors, Power Laws, Publication, Publications, Science, War

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Full Text: [2011\Scientometrics86, 195.pdf](2011/Scientometrics86,%20195.pdf)

Abstract: Text mining was used to extract technical intelligence from the open source global SARS research literature. A SARS-focused query was applied to the Science Citation Index (SCI) (SCI 2008) database for the period 1998-early 2008. The SARS research literature infrastructure (prolific authors, key journals/institutions/countries, most cited authors/journals/documents) was obtained using bibliometrics, and the SARS research literature technical structure (hierarchical taxonomy) was obtained using computational linguistics/document clustering.

Keywords: Bibliometrics, Bibliometrics, China, Citation, Citation Analysis, Clustering, Coronavirus, COV, Database, Database Tomography, Discovery LRD, Infectious Diseases, Intelligence, Literature, Research, SARS, SCI, Science, Science Citation Index, Severe Acute Respiratory Syndrome (SARS), Text Mining

? Sooryamoorthy, R. (2011), Scientific publications of engineers in South Africa, 1975-2005. *Scientometrics*, **86** (1), 211-226.

Full Text: [2011\Scientometrics86, 211.pdf](2011/Scientometrics86,%20211.pdf)

Abstract: In the production of scientific knowledge, as revealed by publication output, South Africa is at the forefront of many other countries in the developing world and in the African continent. This study examines for the first time the publication trends of South African engineering researchers for a period of 30 years since 1975. Drawing data from the ISI Web of Knowledge, this paper specifically looks at the publication patterns of engineering researchers in South Africa.

Keywords: Collaboration, Data, Engineering, ISI, Knowledge, Output, Production, Publication, Publication Trends, Publications, Research Collaboration, Researchers, Science, Scientific Production, South Africa, Trends, Web of Knowledge

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Full Text: [2011\Scientometrics86, 227.pdf](2011/Scientometrics86,%20227.pdf)

Abstract: To assess the publication practices of editors in their own journals, we analysed the number of articles that Croatian editors published in the journals they edit. From 2005 to 2008, 256 decision-making editors of 180 journals published a total of 887 publications in their own journals. Out of these, 332 were relevant for their academic promotion. Only 18 editors published 5 or more articles in their own journals. A single journal had regulations for self-publishing in the instructions for authors. Although the majority of editors did not misuse their own journals for scientific publishing and academic promotion, there is a need for greater transparency of the declaration and management of editorial conflict of interest in academic and scholarly journals.

Keywords: Academic Promotion, Authors, Conflict of Interest, Croatia, Decision Making, Guidelines for Authors, Instructions, Journal, Journal Editors, Journals, Promotion, Publication, Publications, Publishing, Transparency

? Prathap, G. (2011), The fractional and harmonic p-indices for multiple authorship. *Scientometrics*, **86** (2), 239-244.

Full Text: [2011\Scientometrics86, 239.pdf](2011/Scientometrics86,%20239.pdf)

Abstract: A proposal is made so that the p-index (a composite performance index that can effectively combine size and quality of scientific papers) can be extended for bibliometric research assessment in cases where multiple authorship is taken into account. The fractional and harmonic p-indices are applied to some recent examples to show their usefulness.

Keywords: Assessment, Authorship, Bibliometric, Bibliometric Research, Bibliometrics, Composite, Fractional Counting, h-Index, h-Index, Harmonic Counting, Index, P-Index, Papers, Performance, Quality, Quality of, Quantity, Recent, Research, Research Assessment, Size

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Full Text: [2011\Scientometrics86, 245.pdf](2011/Scientometrics86,%20245.pdf)

Abstract: It has long been known that scientific output proceeds on an exponential increase, or more properly, a logistic growth curve. The interplay between effort and discovery is clear, and the nature of the functional form has been thought to be due to many changes in the scientific process over time. Here I show a quantitative method for examining the ease of scientific progress, another necessary component in understanding scientific discovery. Using examples from three different scientific disciplines mammalian species, chemical elements, and minor planets I find the ease of discovery to conform to an exponential decay. In addition, I show how the pace of scientific discovery can be best understood as the outcome of both scientific output and ease of discovery. A quantitative study of the ease of scientific discovery in the aggregate, such as done here, has the potential to provide a great deal of insight into both the nature of future discoveries and the technical processes behind discoveries in science.

Keywords: Changes, Chemical, Difficulty, Discovery, Ease, Elements, Growth, Mammals, Mammals, Minor, Minor Planets, Model, Outcome, Potential, Progress, Science, Scientific Output, Scientific Progress, Species, Understanding

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Full Text: [2011\Scientometrics86, 251.pdf](2011/Scientometrics86,%20251.pdf)

Abstract: Multiple-part manuscripts are those submitted to a journal and intended for publication as a series, usually having “Part 1,” “Part I,” ... “Part N” in the title. Although some journals prohibit such submissions, other journals (including Monthly Weather Review) have no such restrictions. To examine how reviewers and editors view multiple-part manuscripts, 308 multiple-part manuscripts submitted to Monthly Weather Review from May 2001 through February 2010 were examined. For multiple-part manuscripts having reached a final decision, 67% were accepted, which was also the average acceptance rate of all manuscripts (67%). Part I manuscripts submitted alone had a lower acceptance rate (61%) than the average, whereas Part II manuscripts submitted alone had a higher acceptance rate (77%) than the average. Two-part manuscripts submitted together had an acceptance rate (67%) comparable to the average. Typical reviewer comments for Part I manuscripts submitted alone included the manuscript being too long for the available results and the author making claims in Part I that would be supported in the unseen Part II. Typical comments for Part 11 manuscripts submitted alone included the somewhat contradictory statements that material was unnecessarily duplicated in the two manuscripts and more repetition was needed between the two parts. For two-part manuscripts submitted together, reviewers often recommended condensing the two manuscripts and merging them into one. In some cases, editors rejected manuscripts even though no reviewer recommended rejection because the sum of all reviewers’ comments would require substantial reorganization of the manuscripts. The results of this study suggest the following recommendations for authors considering writing multiple-part manuscripts: Write manuscripts that are sensibly independent of each other, make minimal reference to unsubmitted manuscripts, and have sufficient and substantiated scientific content within each manuscript.

Keywords: Acceptance, Authors, Comments, Decision, Editors, Journal, Journals, Merging, Multiple-Part Manuscripts, Publication, Rates, Recommendations, Reference, Rejection, Rejection Rate, Restrictions, Reviewers

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Full Text: [2011\Scientometrics86, 261.pdf](2011/Scientometrics86,%20261.pdf)

Abstract: The research output of India in computer science during 1999-2008 is analyzed in this paper on several parameters including total research output, its growth, rank and global publication share, citation impact, share of international collaborative papers and major collaborative partner countries and patterns of research communication in most productive journals. It also analyses the characteristics of most productive institutions, authors and high-cited papers. The publications output and impact of India is also compared with China, South Korea, Taiwan and Brazil.

Keywords: Analyses, Authors, Brazil, Characteristics, China, Citation, Communication, Computer Science, Growth, Impact, India, Information Technology, Institutions, International, Journals, Korea, Mapping, Papers, Publication, Publications, Rank, Research, Research Priorities In Computer, Science, Science Research, Taiwan

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Full Text: [2011\Scientometrics86, 285.pdf](2011/Scientometrics86,%20285.pdf)

Abstract: As indicator weights obtaining is often difficult in all types of evaluation, this paper describes an approach to improve the indicator weights of scientific and technological competitiveness evaluation of Chinese universities. As a public institution funded by Chinese government, the research center for Chinese science evaluation of Wuhan University has completed five annual evaluations for the scientific and technological competitiveness of Chinese universities since 2005, whose abundant and reliable data motivated us to try to improve the weights obtained by the AHP (analytical hierarchy process). Based on these data, we calculated the objective weights of the indicator using the representative mathematical methods of the least square and the variation coefficient. As the weights of AHP can be influenced by the knowledge, experience and preference of experts and the calculated objective weights neglect the subjective judgement information, we integrated the subjective and objective weights by respectively using the additive and multiplicative model to reflect both the subjective considerations of experts and the objective information, and obtained three kinds of integrative weights. Finally, we selected the integrative weights of multiplicative model as the best weights by comparing and analyzing the evaluation results in 2005 and 2009 of each kind of weights. The results show that the evaluation effect of the weights of multiplicative model is indeed the best for all types of Chinese universities among these kinds of weights, and the experts and university principals enquired also basically reached a consensus on the university rankings of the integrative weights of multiplicative model.

Keywords: AHP, Approach, Chinese, Consensus, Data, Evaluation, Experience, Experts, Improvement, Indicator, Indicator Weights, Information, Integrative, Journal Evaluation, Knowledge, Management, Mathematical Methods, Methods, Model, Neglect, Performance, Preference, Public, Rankings, Research, Science, Science Evaluation, Taiwan, Universities, University

? Tang, L. and Shapira, P. (2011), Regional development and interregional collaboration in the growth of nanotechnology research in China. *Scientometrics*, **86** (2), 299-315.

Full Text: [2011\Scientometrics86, 299.pdf](2011/Scientometrics86,%20299.pdf)

Abstract: China is becoming a leading nation in terms of its share of the world’s publications in the emerging nanotechnology domain. This paper demonstrates that the international rise of China’s position in nanotechnology has been underwritten by the emergence of a series of regional hubs of nanotechnology R&D activity within the country. We develop a unique database of Chinese nanotechnology articles covering the period 1990 to mid-2006 to identify the regional distribution of nanotechnology research in China. To build this database, a new approach was developed to clean and standardize the geographical allocation of Chinese publication records. We then analyze the data to understand the regional development of nanotechnology research in China over our study period and to map interregional and international research collaboration linkages. We find that the geographical distribution of China’s domestic nanotechnology research is characterized by regional imbalance, with most of the leading regions located in eastern China, including not only Beijing and Shanghai but also a series of other new regional hubs. There is much less development of nanotechnology research in central and western China. Beijing, Shanghai, and Hong Kong are among the leading Chinese regions for international nanotechnology research collaboration. Other Chinese nanotechnology regions are less focused on international collaboration, although they have developed domestic interregional collaborations. Although new regional research hubs have emerged in the nanotechnology domain, the paper notes that their concentration in eastern China reinforces existing imbalances in science and technology capabilities in China, and in turn this may further reinforce the dominant position of eastern China in the commercialization of new technologies such as nanotechnology.

Keywords: Allocation, Approach, Bibliometric Analysis, China, Chinese, Co-Authorship, Collaboration, Collaborations, Concentration, Country, Data, Database, Development, Distribution, Growth, Hong Kong, Infrastructure, International, Nanoscience, Nanotechnology, Nanotechnology Research, Networks, Patterns, Publication, Publications, Records, Regional, Regional Development, Research, Research Collaboration, Science, Science And Technology, Technologies, Technology

? Hsu, J.W. and Huang, D.W. (2011), Correlation between impact and collaboration. *Scientometrics*, **86** (2), 317-324.

Full Text: [2011\Scientometrics86, 317.pdf](2011/Scientometrics86,%20317.pdf)

Abstract: We obtained data of statistical significance to verify the intuitive impression that collaboration leads to higher impact. We selected eight scientific journals to analyze the correlations between the number of citations and the number of coauthors. For different journals, the single-authored articles always contained the lowest citations. The citations to those articles with fewer than five coauthors are lower than the average citations of the journal. We also provided a simple measurement to the value of authorship with regards to the increase number of citations. Compared to the citation distribution, similar but smaller fluctuations appeared in the coauthor distribution. Around 70% of the citations were accumulated in 30% of the papers, while 60% of the coauthors appeared in 40% of the papers. We find that predicting the citation number from the coauthor number can be more reliable than predicting the coauthor number from the citation number. For both citation distribution and coauthor distribution, the standard deviation is larger than the average value. We caution the use of such an unrepresentative average value. The average value can be biased significantly by extreme minority, and might not reflect the majority.

Keywords: Authorship, Citation, Citations, Coauthorship, Coauthorship, Collaboration, Correlations, Data, Distribution, Impact, Journal, Journals, Measurement, Papers, Scientific Journals, Significance, Standard, Value

? Buter, R.K., Noyons, C.M. and Van Raan, A.F.J. (2011), Searching for converging research using field to field citations. *Scientometrics*, **86** (2), 325-338.

Full Text: [2011\Scientometrics86, 325.pdf](2011/Scientometrics86,%20325.pdf)

Abstract: We define converging research as the emergence of an interdisciplinary research area from fields that did not show interdisciplinary connections before. This paper presents a process to search for converging research using journal subject categories as a proxy for fields and citations to measure interdisciplinary connections, as well as an application of this search. The search consists of two phases: a quantitative phase in which pairs of citing and cited fields are located that show a significant change in number of citations, followed by a qualitative phase in which thematic focus is sought in publications associated with located pairs. Applying this search on publications from the Web of Science published between 1995 and 2005, 38 candidate converging pairs were located, 27 of which showed thematic focus, and 20 also showed a similar focus in the other, reciprocal pair.

Keywords: Application, Citations, Convergence, Dynamics, Emergence, Field, Impact, Interdisciplinarity, Interdisciplinary, Interdisciplinary Research, Journal, Journal Subject Categories, Measure, Model, Nanotechnology, Non-Linear Growth, Patterns, Physics, Publication, Publications, Qualitative, Research, Research Areas, Research Focus, Science, Web of Science

? Franceschini, F. and Maisano, D. (2011), Criticism on the hg-index. *Scientometrics*, **86** (2), 339-346.

Full Text: [2011\Scientometrics86, 339.pdf](2011/Scientometrics86,%20339.pdf)

Abstract: Although composition of bibliometric indicators appears to be desirable, in many cases it may be misleading. After a brief introduction on the properties of scales of measurement, the attention of this communication is focused on a recent composite indicator, the hg-index, suggested by Alonso et al. (Scientometrics 82(2):391-400, 2010). Specifically, hg-index has three major criticalities: (1) the hg scale is the result of a composition of the h- and g-indices, which are defined both on ordinal scales, (2) the equivalence classes of hg are questionable and the substitution rate between h and g may arbitrarily change depending on the specific h and g values, (3) the apparent increase in granularity of hg, with respect to h and g, is illusory and misleading. Argument is supported by several examples.

Keywords: Bibliometric, Bibliometric Indicators, Bibliometrics, Communication, Composite, Composite Indicator, Composition, G-Index, h-Index, hg-Index, Hirsch Index, Indicator, Indicator Composition, Indicators, Measurement, Ordinal Scale, Recent, Scale, Scale Granularity, Scales, Scales of Measurement, Scientometrics, Substitution

? Abramo, G. and D’Angelo, C.A. (2011), National-scale research performance assessment at the individual level. *Scientometrics*, **86** (2), 347-364.

Full Text: [2011\Scientometrics86, 347.pdf](2011/Scientometrics86,%20347.pdf)

Abstract: There is an evident and rapid trend towards the adoption of evaluation exercises for national research systems for purposes, among others, of improving allocative efficiency in public funding of individual institutions. However the desired macroeconomic aims could be compromised if internal redistribution of government resources within each research institution does not follow a consistent logic: the intended effects of national evaluation systems can result only if a “funds for quality” rule is followed at all levels of decision-making. The objective of this study is to propose a bibliometric methodology for: (i) large-scale comparative evaluation of research performance by individual scientists, research groups and departments within research institution, to inform selective funding allocations, and (ii) assessment of strengths and weaknesses by field of research, to inform strategic planning and control. The proposed methodology has been applied to the hard science disciplines of the Italian university research system for the period 2004-2006.

Keywords: Adoption, Assessment, Bibliometric, Bibliometric Indicators, Bibliometrics, Control, Decision Making, Decision-Making, Efficiency, Evaluation, Exercises, Field, Funding, Institutions, Italy, Logic, Methodology, Output, Performance, Planning, Public, Redistribution, Research, Research Assessment Exercises, Research Funding, Research Performance, Resources, Science, Strategic, Strategic Planning, Systems, Trend, University

? Chen, Y.C., Yeh, H.Y., Wu, J.C., Haschler, I., Chen, T.J. and Wetter, T. (2011), Taiwan’s National Health Insurance Research Database: Administrative health care database as study object in bibliometrics. *Scientometrics*, **86** (2), 365-380.

Full Text: [2011\Scientometrics86, 365.pdf](2011/Scientometrics86,%20365.pdf)

Abstract: The trend to use administrative health care databases as research material is increasing but not well explored. Taiwan’s National Health Insurance Research Database (NHIRD), one of the largest administrative health care databases around the world, has been used widely in academic studies. This study analyzed 383 NHIRD studies published between 2000 and 2009 to quantify the effects on overall growth, scholar response, and spread of the study fields. The NHIRD studies expanded rapidly in both quantity and quality since the first study was published in 2000. Researchers usually collaborated to share knowledge, which was crucial to process the NHIRD data. However, once the fundamental problem had been overcome, success to get published became more reproducible. NHIRD studies were also published diversely in a growing number of journals. Both general health and clinical science studies benefited from NIIIRD. In conclusion, this new research material widely promotes scientific production in a greater magnitude. The experience of Taiwan’s NHIRD should encourage national- or institutional-level data holders to consider re-using their administrative databases for academic purposes.

Keywords: Administrative Health Care Database, Bibliometric Analysis, Bibliometrics, Care, Clinical, Data, Database, Databases, Epidemiologic Research, Experience, First, General, Growth, Health, Health Care, Journals, Knowledge, Knowledge Growth, National Health Insurance Research Database, Pharmacoepidemiology, Quality, Research, Research Material, Science, Scientific Production, Secondary Data Sources, Trend, World

? Hsieh, C.M. (2011), Explicitly searching for useful inventions: Dynamic relatedness and the costs of connecting versus synthesizing. *Scientometrics*, **86** (2), 381-404.

Full Text: [2011\Scientometrics86, 381.pdf](2011/Scientometrics86,%20381.pdf)

Abstract: Inventions combine technological features. When features are barely related, burdensomely broad knowledge is required to identify the situations that they share. When features are overly related, burdensomely broad knowledge is required to identify the situations that distinguish them. Thus, according to my first hypothesis, when features are moderately related, the costs of connecting and costs of synthesizing are cumulatively minimized, and the most useful inventions emerge. I also hypothesize that continued experimentation with a specific set of features is likely to lead to the discovery of decreasingly useful inventions, the earlier-identified connections reflect the more common consumer situations. Covering data from all industries, the empirical analysis provides broad support for the first hypothesis. Regressions to test the second hypothesis are inconclusive when examining industry types individually. Yet, this study represents an exploratory investigation, and future research should test refined hypotheses with more sophisticated data, such as that found in literature-based discovery research.

Keywords: Analysis, Connections, Costs, Count Data, Data, Discovery, Dynamic, First, Indicators, Innovative Activities, Inventions, Investigation, Knowledge, Lead, Learning-Curve, Linkage, Literature-Based Discovery, Opportunity Recognition, Patent Citations, Patents, Performance, Relatedness, Research, Science-and-Technology, Search, Support

? Hosotsubo, M. (2011), A statistical study of transferral and promotion mechanisms relating to the appointment of professors at Japanese national universities based on cross tabulation and log-linear model analysis. *Scientometrics*, **86** (2), 405-430.

Full Text: [2011\Scientometrics86, 405.pdf](2011/Scientometrics86,%20405.pdf)

Abstract: The aim of this study is to use the Japanese university employee list (published by Kojunsha) to compile a database of teacher transferrals in higher education (HM-DB) at 9 points in time over the 21-year period from 1988 to 2008, and then to use this database to assess and analyze the status of national university teachers immediately before and after assuming office as professors in order to gain some understanding of the transferral mechanisms of teachers at Japan’s national universities. From the results of cross-tabulation analysis, it has become clear that a growing proportion of transfers involving the appointment of professors involve movements between very similar universities (transferral blocking phenomenon), and that there is a growing tendency for professorial appointments to involve a migration from universities with a lower share of published research papers to universities with a higher share. Also, by constructing a log-linear model and performing a residual analysis, we have found that although these trends are clearly apparent, they do not yet have a great deal of influence.

Keywords: Analysis, Appointment of Professors To National Universities, Cross Tabulation, Database, Education, Higher Education, Log Linear Model, Mechanisms, Migration, Model, Papers, Promotion, Research, Transferral, Trends, Understanding, Universities, University

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Full Text: [2011\Scientometrics86, 431.pdf](2011/Scientometrics86,%20431.pdf)

Abstract: As an adaptation to its new environment, universities have engaged in various organisational innovations and taken a more active role in the orientation of the researcher. The emerging institutional management imposes specific constraints and opportunities for researchers. Thus, the impact of institutional membership, notably on the different institutional policies, is increasingly a dominant force in academic working lives. However, some scholars have argued that the context of researchers remains an Ivory Tower situation, where academic working life is defined through the twin discourse of academic freedom and professional autonomy. This article analyses the activities of research faculty members funded by the Natural Sciences and Engineering Research Council of Canada, in comparison to the theories that contribute to the explanation of researchers’ behaviour. By using intra-class correlation, which is based on a multi-level analysis of the variance distribution, we find that the grouping effect is still small. In other words, despite the emerging constraints and opportunities determined by their institutional context, researchers still exist in an Ivory Tower, where the explanation of their behaviour is still a matter of individual differences.

Keywords: Adaptation, Analyses, Analysis, Autonomy, Behaviour, Canada, Comparison, Context, Correlation, Discourse, Distribution, Engineering, Environment, Explanation, Faculty, Force, Freedom, Higher-Education, Impact, Institutional Management, Intellectual Property, Ivory Tower, Life, Management, Multi-Level Variance Analysis, Natural, Nested, Policies, Research, Research Productivity, Research Selectivity, Research University, Role, Sciences, Small, Spin-Offs, Structure, Time Allocation, Triple-Helix Indicators, Twin, UK Universities, Universities

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Full Text: [2011\Scientometrics86, 449.pdf](2011/Scientometrics86,%20449.pdf)

Abstract: Disciplines vary in the types of communicative genres they use to disseminate knowledge and citing patterns used within these genres. However, citation analyses have predominately relied on the references and citations of one type of communicative genre. It is argued that this is particularly problematic for studies of interdisciplinarity, where analyses bias the disciplines that communicate using the genre under investigation. This may lead to inaccurate or incomplete results in terms of fully understanding the interrelationships between disciplines. This study analyzes a set of 15,870 references from 97 US dissertations, in order to demonstrate the difference in discipline and author rankings, based on the genre under investigation. This work encourages future work that takes into account multiple citing and cited works, especially where indicators of interdisciplinarity are used for the allocation of resources or ranking of scholars.

Keywords: Allocation, Analyses, Bias, Citation, Citation Analysis, Citations, Collaboration, Communicative Genres, Disciplinarity, Indicators, Interdisciplinarity, Investigation, Knowledge, LC Class, Lead, Map, Networks, Ranking, Rankings, References, Resources, Science, Understanding, US, Work

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Full Text: [2011\Scientometrics86, 463.pdf](2011/Scientometrics86,%20463.pdf)

Abstract: This article analyzes some of the most popular scientific journals in the Manufacturing field from the point of view of four bibliometric indicators: the ISI impact factor (ISI-IF), the Hirsch (h) index-for-journal, the total number of citations and the h-spectrum. h-spectrum is a novel tool based on h, making it possible to (i) identify a reference profile of the typical authors of a journal, (ii) compare different journals and (iii) provide a rough indication of their “bibliometric positioning” in the scientific community. Results of this analysis can be helpful for guiding potential authors and members of the scientific community in the Manufacturing area. Of particular interest is the construction of maps based on h-spectrum and IST-IF to compare journals and monitor their bibliometric positioning over time. A large amount of empirical data are presented and discussed.

Keywords: Analysis, Authors, Bibliometric, Bibliometric Indicators, Bibliometric Positioning, Bibliometrics, Citations, Community, Construction, Data, Distributions, Field, h-Index, Hirsch, Hirsch Index, Hirsch Spectrum, Hirsch-Index, Impact, Impact Factor, Indication, Indicators, Isi, Journal, Journal Authors, Journals, Manufacturing, Manufacturing Journal, Potential, Reference, Scientific Journals, Tail

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Full Text: [2011\Scientometrics86, 487.pdf](2011/Scientometrics86,%20487.pdf)

Abstract: This study presents a historical overview of the International Conference on Human Robot Interaction (HRI). It summarizes its growth, internationalization and collaboration. Rankings for countries, organizations and authors are provided. Furthermore, an analysis of the military funding for HRI papers is performed. Approximately 20% of the papers are funded by the US Military. The proportion of papers from the US is around 65% and the dominant role of the US is only challenged by the strong position of Japan, in particular by the contributions by AIR.

Keywords: Air, Analysis, Authors, Bibliometrics, Collaboration, Conference, First, Funding, Google Scholar, Growth, HRI, Impact, Index, Internationalization, Japan, Military, Papers, Rankings, Reflection, Role, Science, US

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Full Text: [2011\Scientometrics86, 505.pdf](2011/Scientometrics86,%20505.pdf)

Abstract: The study focuses on publication activity, citation impact and citation links between publications and patents in biotechnology. The European Union (EU), US, Japan and China are the most important global players. However, the landscape is changing since the EU and the US are losing ground because of challenges from a group of emerging economies. National profiles differ between the two groups of main players and upcoming countries, the focus on red biotechnology in the US and Europe is contrasted by propensity for white and green technology in Asia. Furthermore, the subject profile of biotechnology papers citing patents and cited by patents as well as the relationship between patent citations and citation impact in scientific literature is explored. Papers that cite patents tend to reflect propensity towards white biotechnology while patent-cited publications have a higher relative share in red biotechnology. No significant difference concerning the citation impact of publications ‘citing patents’ and ‘not citing patents’ can be found. This is contrasted by the observation that patent-cited papers perform distinctly better in terms of standard bibliometric indicators than comparable publications that are not linked to technology in this direction.

Keywords: Asia, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Biology, Biotechnology, China, Citation, Citation Impact, Citations, Eu, Europe, European Union, Germany, Impact, Indicators, International Collaboration, Japan, Knowledge-Base, Landscape, Literature, Observation, Papers, Patent, Patent Citation, Patent Citations, Patents, Profiles, Publication, Publication Activity, Publications, Red Biotechnology, Science Fields, Science-Technology Linkage, Scientific Literature, Standard, Statistics, Technology, US

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Full Text: [2011\Scientometrics86, 527.pdf](2011/Scientometrics86,%20527.pdf)

Abstract: Academic research groups are treated as complex systems and their cooperative behaviour is analysed from a mathematical and statistical viewpoint. Contrary to the naive expectation that the quality of a research group is simply given by the mean calibre of its individual scientists, we show that intra-group interactions play a dominant role. Our model manifests phenomena akin to phase transitions which are brought about by these interactions, and which facilitate the quantification of the notion of critical mass for research groups. We present these critical masses for many academic areas. A consequence of our analysis is that overall research performance of a given discipline is improved by supporting medium-sized groups over large ones, while small groups must strive to achieve critical mass.

Keywords: Agence D’Evaluation De La Recherche Et De L’Enseignement Superieur, Analysis, Behaviour, Complex Systems, Critical Mass in Research, Dependency, Dynamics, Model, Notion, Performance, Phase Transitions, Quality, Quality of, Quantification, Research, Research Assessment Exercise, Research Excellence Framework, Research Funding, Research Performance, Research Policy, Research Quality, Role, Size, Small, Systems

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Full Text: [2011\Scientometrics86, 541.pdf](2011/Scientometrics86,%20541.pdf)

Abstract: The HIV/AIDS pandemic is of international interest with the 2008 Nobel Prize in physiology or medicine having being awarded for the discovery of the virus that causes AIDS. South Africa has a particular interest in the field of HIV/AIDS research as it is the country with the largest number of HIV infections in the world and the issue has created a number of political and scientific debates. This investigation identifies the state of HIV/ AIDS related research in South Africa vis-a-vis the rest of the world using evaluative scientometrics in order to inform relevant policy. South Africa is identified as producing an increasing number of HIV/AIDS related publications, making it one of the most prolific fields in the country. The rest of the world appears to have stabilized its research efforts after the development of highly active antiretroviral therapies. The USA is identified as the main producer of HIV/AIDS research while Europe appears to under-emphasise the issue. Comparison of the world’s most prolific universities with those in South Africa identifies that the latter has a fragmented system. A number of policy issues are discussed.

Keywords: Africa, Aid, Aids, Country, Development, Discovery, Europe, Field, Highly Active, HIV, HIV Infections, HIV, AIDS, Human Immunodeficiency Virus, Infections, International, Investigation, Medicine, Physiology, Policy, Publications, Research, Science Policy, Scientometrics, South Africa, State, Universities, USA, World

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Full Text: [2011\Scientometrics86, 553.pdf](2011/Scientometrics86,%20553.pdf)

Abstract: The CiteSeer digital library is a useful source of bibliographic information. It allows for retrieving citations, co-authorships, addresses, and affiliations of authors and publications. In spite of this, it has been relatively rarely used for automated citation analyses. This article describes our findings after extensively mining from the CiteSeer data. We explored citations between authors and determined rankings of influential scientists using various evaluation methods including citation and in-degree counts, HITS, PageRank, and its variations based on both the citation and collaboration graphs. We compare the resulting rankings with lists of computer science award winners and find out that award recipients are almost always ranked high. We conclude that CiteSeer is a valuable, yet not fully appreciated, repository of citation data and is appropriate for testing novel bibliometric methods.

Keywords: Analyses, Authors, Bibliometric, Bibliometric Methods, Citation, Citation Analysis, Citations, Citeseer, Collaboration, Communities, Computer-Science Literature, Data, Evaluation, Evaluation Methods, Google Scholar, Information, Journals, Mar, Methods, Mining, Networks, Pagerank, Publications, Ranking, Rankings, Science, Source, Testing, Web

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Full Text: [2011\Scientometrics86, 563.pdf](2011/Scientometrics86,%20563.pdf)

Abstract: The criteria for the evaluation of scientific journals have changed from characteristics of its contents to citations of articles. Among many problems associated with citation-based evaluation methods are that it is applicable only to a limited number of journals, preferential selection of citable documents, differential values to citations, time duration for assessment, etc. The proposed index, Aggregated Citations of Cited Articles (ACCA), is calculated based on citations data, derived from only of cited articles, and therefore can be validated from standard database. While giving more importance to citations, the number of cited articles published in a journal also has some influence in the new index. The calculated values are consistent with time and can be used to back-track the status of a journal in its past and for continued evaluation. The new Index ensures neutrality, qualitative and quantitative hierarchy and consistency in the estimation of journal ranking.

Keywords: Acca, Assessment, Characteristics, Citation, Citations, Consistency, Criteria, Data, Database, Duration, Evaluation, Evaluation Methods, Impact Factor, Impact-Factor, Index, Journal, Journal Evaluation, Journals, Mar, Methods, Qualitative, Rank, Ranking, Science, Scientific Journals, Standard, Tool

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Full Text: [2011\Scientometrics86, 575.pdf](2011/Scientometrics86,%20575.pdf)

Abstract: In 1989 the Spanish Government established an individual retrospective research evaluation system (RES) for public researchers. Policy makers have associated the establishment of this evaluation system with the significant increase in the volume of scientific publications attributed to Spain over the last decades. In a similar vein to the analyses of other country cases, some scholars have also claimed that the growth of Spain’s international scientific publications is a result of the establishment of the new evaluation system. In this paper, we provide a methodological revision of the validity threats in previous research, including some interrupted time-series analyses and control groups to investigate the effects of this policy instrument on the number of papers produced by Spanish authors. In the years following the establishment of the evaluation system, the results indicate a considerable increase in the number of papers attributed to Spanish authors among those eligible for evaluation (the “treated” group), but also in the control groups. After testing various alternative explanations, we conclude that the growth in Spanish publications cannot be attributed indisputably to the effect of the establishment of the RES, but rather to the increase of expenditure and number of researchers in the Spanish R&D system along with some maturation effects. We take this case as an example of the need to improve and refine methodologies and to be more cautious when attributing effects to research evaluation mechanisms at the national level.

Keywords: Alternative, Analyses, Assumptions, Authors, CNEAI, Control, Control Groups, Countries, Country, Effects of Evaluations, Evaluation, Growth, Impact, Indicators, International, Interrupted Time Series, Mar, Maturation, Mechanisms, Methodologies, Papers, Performance, Policy, Public, Publication, Publications, Quasi-Experimental Design, Regression Artifacts, Research, Research Evaluation, Research Evaluation Systems, Science, Scientific Production, Scientific Publications, Spain, Spain, Spanish, Systems, Testing, Time Series, Validity, Volume

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Full Text: [2011\Scientometrics86, 593.pdf](2011/Scientometrics86,%20593.pdf)

Abstract: The aim of this paper is to identify the research status quo on pervasive and ubiquitous computing via scientometric analysis. Information visualization and knowledge domain visualization techniques were adopted to determine how the study of pervasive and ubiquitous computing has evolved. A total of 5,914 papers published between 1995 and 2009 were retrieved from the Web of Science with a topic search of pervasive or ubiquitous computing. CiteSpace is a java application for analyzing and visualizing a wide range of networks from bibliographic data. By use of it, we generated the subject category network to identify the leading research fields, the research power network to find out the most productive countries and institutes, the journal co-citation map to identify the distribution of core journals, the author co-citation map to identify key scholars and their co-citation patterns, the document co-citation network to reveal the ground-breaking literature and detect the co-citation clusters on pervasive and ubiquitous computing, and depicted the hybrid network of keywords and noun phrases to explore research foci on pervasive and ubiquitous computing over the entire span 1995-2009.

Keywords: 21st-Century, Analysis, Application, Author Cocitation, Co-Citation, Co-Citation Cluster Analysis, Cocitation, Context, Data, Distribution, Document Co-Citation Analysis, Domain-Analysis, Hybrid, Information-Science, Intellectual Structure, Journal, Journals, Knowledge, Literature, Mar, Mobile, Network, Networks, Papers, Pervasive and Ubiquitous Computing, Power, Research, Research Foci, Science, Scientific Literature, Scientometric, Techniques, Visualization, Web Of Science

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Full Text: [2011\Scientometrics86, 613.pdf](2011/Scientometrics86,%20613.pdf)

Abstract: This study used a bibliometric method to find quantitative evidence of publication and citing patterns within UK academia. The publications of a random sample of UK research-active academics for each of the years 2003 and 2008-were collected and analysed to gather data regarding referencing practices, along with any identifiable trends between the 2 years. References were categorised by type of material to show the proportions of each type used. Comparisons between the 2 years showed that the use of journal articles had increased. There was also an increase in the average number of publications per author. A large number of authors had no publications in the target years.

Keywords: Analysis, Authors, Bibliometric, Citation, Cited References, Data, Disciplinary Differences, Evidence, Humanities, Journal, Journal Articles, Mar, Monographs, Multiple Authorship, Philosophy, Practices, Publication, Publication Behaviour, Publications, Random Sample, References, Referencing, Research Assessment, Social-Sciences, Sociology, Trends, UK

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Full Text: [2011\Scientometrics86, 629.pdf](2011/Scientometrics86,%20629.pdf)

Abstract: Policy makers, at various levels of governance, generally encourage the development of research collaboration. However the underlying determinants of collaboration are not completely clear. In particular, the literature lacks studies that, taking the individual researcher as the unit of analysis, attempt to understand if and to what extent the researcher’s scientific performance might impact on his/her degree of collaboration with foreign colleagues. The current work examines the international collaborations of Italian university researchers for the period 2001-2005, and puts them in relation to each individual’s research performance. The results of the investigation, which assumes co-authorship as proxy of research collaboration, show that both research productivity and average quality of output have positive effects on the degree of international collaboration achieved by a scientist.

Keywords: Analysis, Bibliometrics, Co-Authorship, Co-Authorships, Coauthorship, Collaboration, Collaborations, Development, Governance, Impact, International, Internationalization, Investigation, Italy, Literature, Mar, Methodology, Performance, Policy, Productivity, Quality, Quality of, Research, Research Collaboration, Research Collaboration, Research Performance, Research Productivity, Scientific Performance, Universities, University, Work

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Full Text: [2011\Scientometrics86, 645.pdf](2011/Scientometrics86,%20645.pdf)

Abstract: Yearly publication counts of research institutions and universities continue to be a widely-used parameter to assess their research productivity, and such evaluations have been successfully used to analyze the influence of research support policies at various levels. This study was designed to analyze the yearly number of articles having an Akdeniz University address and that appeared in the Web of Science databases from 1996 to 2009. Time series analysis of the number of published articles was used to determine the impact of alterations in the number of faculty members and research funding as well as changes in the institutional and country-wide research support policies and encouragement mechanisms. It was observed that alterations in both the number of faculty members who are active in research and the total amount of research funding each year may explain the general pattern published articles. However, there is a period with significant deviations from the trend predicted by these relationships. This period, corresponding to the years 2002-2008, is discussed in terms of the effects of policy changes which may have positive and negative contributions to the predicted pattern. Mathematical analysis of publication time series, together with parameters expected to affect research output, may provide valuable insight into the effectiveness of research support mechanisms.

Keywords: Analysis, Articles, Changes, Databases, Effectiveness, Faculty, Funding, General, Impact, Institutions, Mar, Mechanisms, Pattern, Policies, Policy, Productivity, Publication, Publication Counts, Research, Research Funding, Research Productivity, Research Support, Science, Support, Time Series, Time-Series Analysis, Trend, Turkey, Universities, University, Web of Science

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Full Text: [2011\Scientometrics86, 657.pdf](2011/Scientometrics86,%20657.pdf)

Abstract: This paper aims to reveal the relationship and structure of library and information science (LIS) journals in China. 24 core LIS journals in China are selected and the relevant data of journal co-citation are retrieved from Chinese Journal Full-Text Database constructed by China National Knowledge Infrastructure during the period of 1999-2009. By calculating mean co-citation frequencies and correlation coefficients, we find that there is a strong relationship among LIS journals in China. Utilizing the methods of cluster analysis, multidimensional scaling analysis and factor analysis, we analyze the data of journal co-citation. LIS journals in China are divided into four clusters. The relatedness among journals is shown manifestly through their locations in the two-dimensional map. A three-factor solution is obtained with the factor loading of each journal. Finally, we interpret and discuss the results to get some conclusions and also expect to describe the network characters of journal co-citation in future research.

Keywords: Analysis, China, Chinese, Citation, Cluster, Cluster Analysis, Co-Citation, Co-Citation Analysis, Cocitation, Constructed, Correlation, Data, Factor Analysis, Information, Information Science, Intellectual Space, Journal, Journal Co-Citation, Journal Co-Citation Analysis, Journals, Library And Information Science, LIS, LIS Journals, Loading, Mar, Methods, Multidimensional, Multidimensional Scaling, Multivariate Statistical Analysis, Network, Research, Scaling, Science, Solution, Structure

? Fragkiadaki, E., Evangelidis, G., Samaras, N. and Dervos, D.A. (2011), f-Value: measuring an article’s scientific impact. *Scientometrics*, **86** (3), 671-686.

Full Text: [2011\Scientometrics86, 671.pdf](2011/Scientometrics86,%20671.pdf)

Abstract: The f-value is a new indicator that measures the importance of a research article by taking into account all citations received, directly and indirectly, up to depth n. The f-value considers all information present in a Citation Graph in order to produce a ranking of the articles. Apart from the mathematical equation that calculates the f-value, we also present the corresponding algorithm with its implementation, plus an experimental comparison of f-value with two known indicators of an article’s scientific importance, namely, the number of citations and the Page Rank for citation analysis. Finally, we discuss the similarities and differences among the indicators.

Keywords: Algorithm, Analysis, Citation, Citation Analysis, Citation Graph, Citations, Comparison, Experimental, f-Value, h-Index, Impact, Implementation, Indicator, Indicators, Information, Mar, Output, Page Rank, Publication, Ranking, Research, Scientific Impact

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Full Text: [2011\Scientometrics86, 687.pdf](2011/Scientometrics86,%20687.pdf)

Abstract: Technology analysis is a process which uses textual analysis to detect trends in technological innovation. Co-word analysis (CWA), a popular method for technology analysis, encompasses (1) defining a set of keyword or key phrase patterns which are represented in technology-dependent terms, (2) generating a network that codifies the relations between occurrences of keywords or key phrases, and (3) identifying specific trends from the network. However, defining the set of keyword or key phrase patterns heavily relies on effort of experts, who may be expensive or unavailable. Furthermore defining keyword or key phrase patterns of new or emerging technology areas may be a difficult task even for experts. To solve the limitation in CWA, this research adopts a property-function based approach. The property is a specific characteristic of a product, and is usually described using adjectives, the function is a useful action of a product, and is usually described using verbs. Properties and functions represent the innovation concepts of a system, so they show innovation directions in a given technology. The proposed methodology automatically extracts properties and functions from patents using natural language processing. Using properties and functions as nodes, and co-occurrences as links, an invention property-function network (IPFN) can be generated. Using social network analysis, the methodology analyzes technological implications of indicators in the IPFN. Therefore, without predefining keyword or key phrase patterns, the methodology assists experts to more concentrate on their knowledge services that identify trends in technological innovation from patents. The methodology is illustrated using a case study of patents related to silicon-based thin film solar cells.

Keywords: Analysis, Approach, Case Study, Citations, Co-Word Analysis, Concentrate, Experts, Function, Functions, Indicators, Innovation, Knowledge, Limitation, Mar, Methodology, Natural, Natural Language Processing, Network, Network Analysis, Patent Analysis, Patent Mining, Patents, Property, Relations, Research, Services, Social, Social Network Analysis, Solar Cells, Technological Innovation, Technological Trend, Technology, Technology Analysis, Thin Film, Trends

? Hammarfelt, B. (2011), Interdisciplinarity and the intellectual base of literature studies: Citation analysis of highly cited monographs. *Scientometrics*, **86** (3), 705-725.

Full Text: [2011\Scientometrics86, 705.pdf](2011/Scientometrics86,%20705.pdf)

Abstract: This article studies interdisciplinarity and the intellectual base of 34 literature journals using citation data from Web of Science. Data from two time periods, 1978-1987 and 1998-2007 were compared to reveal changes in the interdisciplinary citing of monographs. The study extends the analysis to non-source publications, using the classification of monographs to show changes in the intellectual base. There is support for increased interdisciplinary citing of sources, especially to the social sciences, and changes in the intellectual base reflect this. The results are explained using theories on the intellectual and social organization of scientific fields and the use of bibliometric methods on the humanities is discussed. The article demonstrates how citation analysis can provide insights into the communication patterns and intellectual structure of scholarly fields in the arts and humanities.

Keywords: Analysis, Arts-And-Humanities, Bibliometric, Bibliometric Methods, Changes, Citation, Citation Analysis, Classification, Communication, Data, Humanities, Index, Intellectual Structure, Interdisciplinarity, Interdisciplinary, Journals, Library, Literature, Literature Studies, Mar, Methods, Organization, Publications, Science, Sciences, Social, Social Sciences, Social-Sciences, Sources, Structure, Support, Web of Science

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Full Text: [2011\Scientometrics86, 727.pdf](2011/Scientometrics86,%20727.pdf)

Abstract: This paper describes the different forms of and tries to give reasons for international scientific collaboration in general. It focuses on eleven countries in the Asia-Pacific region by evaluating their national research output with the help of bibliometric indicators in particular. Over two million journal articles published by these countries between 1998 and 2007 in ISI-listed periodicals are analyzed. Discipline-specific publication and citation profiles reveal national strengths and weaknesses in the different research domains. The exponential increase in publication output by China over the last few years is astonishing, but in terms of visibility, i.e. citation rates, China cannot keep up with leading science nations, remaining below the world average. A discipline-specific analysis shows that Chinese authors took an active part in more than a quarter of all articles and reviews published in the field of materials science in 2007, while their contribution to medical research is very low. Co-publication networks among the eleven countries are generated to observe the development of cooperation bonds in the region. Applying Salton’s measure of international collaboration strength, an above-average strengthening of scientific collaboration in the Asia-Pacific region can be observed.

Keywords: Analysis, Asia Pacific, Asia-Pacific Research Area, Authors, Bibliometric, Bibliometric Indicators, China, Chinese, Citation, Collaboration, Cooperation, Country Level Study, Development, Discipline Specific Publication Profiles, Field, Forms, General, Indicators, International, Journal, Journal Articles, Mar, Measure, Medical, Medical Research, Nations, Networks, Periodicals, Profiles, Publication, Rates, Region, Research, Reviews, Science, Scientific Collaboration, Scientific Cooperation, Strength, Visibility, World

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Full Text: [2011\Scientometrics86, 747.pdf](2011/Scientometrics86,%20747.pdf)

Abstract: Better research quality not only inspires scholars to continue their research, but also increases the possibility of higher research budgets from sponsors. Given the importance of research quality, this study proposes that utilizing social capital (i.e., research collaboration) might be a promising avenue to achieve better research quality. In addition, as every scholar has his or her own expertise and knowledge, the diversity of collaborating members might be an extra resource for reinforcing research quality. The purpose of this study is to investigate the impact of research collaboration and member diversity on research quality, including the number of citations, the impact factor, and the size of the research award. To explore unknown associations, the author adopts two data sources, that is, the Social Science Citation Index database and academic database of a university, to verify the hypotheses. The results show that a higher intensity at which scholars are embedded in a collaboration network, results in higher research quality. However, member diversity does not seem to be a major concern during the organization of a research group. Research quality is not affected, regardless of whether a scholar collaborates with different or the same co-authors.

Keywords: Articles, Citation, Citations, Co-Authors, Collaboration, Collaboration Networks, Data, Database, Diversity, Exploitation, Exploration, Exploration And Exploitation, Impact, Impact Factor, Impacts, Information-Systems Research, Knowledge, Knowledge Creation, Mar, Member Diversity, Network, Networks, Organization, Outcomes, Perspective, Purpose, Quality, Research, Research Collaboration, Research Quality, Science, Science Citation Index, Size, Social, Social Capital, Social Network, Social Networks, Social Science Citation Index, Socialization, Sources, University

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Full Text: [2011\Scientometrics86, 763.pdf](2011/Scientometrics86,%20763.pdf)

Abstract: This study analyzed the use of acknowledgements in medical articles published in five countries (Venezuela, Spain, France, UK and USA) from 1950 to 2010. For each country, we selected 54 papers (18 research papers, 18 reviews and 18 case reports), evenly distributed over six decades, from two medical journals with the highest impact factors. Only papers written by native speakers in the national language were included. The evolution of the frequency and length of acknowledgments was analyzed. Of 270 articles studied, 127 (47%) had acknowledgments. The presence of acknowledgments was associated with country (p = 0.001), this section being more common and longer in US and UK journals. Acknowledgments were most common in research papers (70 vs. 40% in case reports and 31% in reviews, p < 0.001). Reviews without acknowledgments were significantly more common than those with (69 vs. 31%), but there was no trend in case reports. Altogether, articles with acknowledgments predominated only after 2000. Since the frequency of use of acknowledgments remained stable over time in US and UK journals but increased in non-Anglophone journals, the overall increase is attributed to the change in non-English publications. Authors acknowledged sub-authorship more in English language journals than in those published in the national language in France, Spain and Venezuela. However, the practice of acknowledging is increasing in non-Anglophone journals. We conclude that the concept of intellectual indebtedness does not only differ from one geographical context to another, but also over time and from one academic genre to another.

Keywords: Acknowledgment, Acknowledgments, Approach, Articles, Authorship, Case Reports, Collaboration, Context, Country, Diachronic, Discourse, Dissertation Acknowledgments, Distributed, English, Evolution, France, Genre, Genre, Impact, Impact Factors, Journals, Length, Mar, Medical, Medical Journals, Medicine, Papers, Patterns, Practice, Publications, Research, Research Article, Researchers, Review Article, Reviews, Social-Sciences, Spain, Spanish, Trend, UK, US, USA

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Full Text: [2011\Scientometrics86, 785.pdf](2011/Scientometrics86,%20785.pdf)

Abstract: In the assessment of success of new analgesic drugs over the past 50 years (Kissin, Anesth Analg 110:780-789, 2010) we observed a difference in the publication response to a new drug between biomedical journals in general and top journals: number of published articles on a drug increased (and declined) more rapidly in the top journals. Based on this phenomenon we present a new publication indicator-the Top Journal Selectivity Index (TJSI). It represents the ratio between the number of all types of articles in the top 20 biomedical journals and the number of articles in all (> 5,000) journals covered by Medline, over 5 years after a drug’s introduction. Ten analgesics developed during the period 1986-2009 were selected for analysis. Three publication indices were used for assessment: the number of all types of articles presented in Medline, the number of articles covering only randomized controlled trials (RCT), and the Top Journal Selectivity Index. We also assessed the success score in the development of these analgesics based on the following criteria: novelty of molecular target, analgesic efficacy, and response by the pharmaceutical market. The relationships between the publication indices and analgesic’s success score were determined with the use of the Pearson correlation coefficient. Positive relationship was found only with the Top Journal Selectivity Index (r = 0.876, p < 0.001). We suggest that this index can predict success in drug development at least in the field of analgesics.

Keywords: Analgesic, Analgesics, Analysis, Assessment, Bibliometric, Bibliometric Indicator, Bibliometrics, Biomedical, Biomedical Journals, Correlation, Correlation Coefficient, Criteria, Development, Drug, Drug Development, Drugs, Efficacy, Field, General, Impact Factor, Index, Indicator, Indices, Journal, Journals, Mar, Market, Metaanalysis, Migraine, New Drugs, Novelty, Pain, Publication, Randomized, Randomized Controlled Trials, RCT, Topic-Specific Publications, Trials

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Full Text: [2011\Scientometrics87, 1.pdf](2011/Scientometrics87,%201.pdf)

Abstract: This study examines the identity and development of the management information systems (MIS) field through a scientometric lens applied to three major global, regional and national conferences: International Conference on Information Systems (ICIS), Pacific Asia Conference on Information Systems (PACIS) and Administrative Sciences Association of Canada Annual Conference (ASAC). It adapts the conference stakeholder approach to the construction of the identity of the MIS discipline and analyzes the proceedings of these three conferences. The findings suggest that the MIS field has been evolving in terms of collaborative research and scholarly output and has been gradually moving towards academic maturity. The leading MIS conference contributors tend to establish loyalty to a limited number of academic meetings. At the same time, relatively low levels of repeat publication in the proceedings of ICIS, PACIS and ASAC were observed. It was suggested that Lotka’s and Yule-Simon’s bibliometric laws may be applied to measure and predict the degree of conference delegate loyalty.

Keywords: Approach, Asac, Asia, Authorship, Bibliometric, Canada, Citation, Collaborative Research, Conference, Conferences, Construction, Development, Diversity, Field, ICIS, Identity Crisis, Impact, Information, Information Systems, Laws, Lotka’s Law, Lotkas Law, Loyalty, Management, Management Information, Management Information Systems, Measure, MIS, Pacis, Patterns, Productivity, Productivity, Publication, Regional, Research, Scholarly Output, Science, Scientific Collaboration, Scientometric, Systems, Yule-Simon’S Law

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Full Text: [2011\Scientometrics87, 14.pdf](2011/Scientometrics87,%2014.pdf)

Abstract: The paper is concerned with analysing what makes a great journal great in the sciences, based on quantifiable Research Assessment Measures (RAM). Alternative RAM are discussed, with an emphasis on the Thomson Reuters ISI Web of Science database (hereafter ISI). Various ISI RAM that are calculated annually or updated daily are defined and analysed, including the classic 2-year impact factor (2YIF), 5-year impact factor (5YIF), Immediacy (or 0-year impact factor (0YIF)), Eigenfactor, Article Influence, C3PO (Citation Performance Per Paper Online), h-index, Zinfluence, PI-BETA (Papers Ignored-By Even The Authors), Impact Factor Inflation (IFI), and three new RAM, namely Historical Self-citation Threshold Approval Rating (H-STAR), 2 Year Self-citation Threshold Approval Rating (2Y-STAR), and Cited Article Influence (CAI). The RAM data are analysed for the 6 most highly cited journals in 20 highly-varied and well-known ISI categories in the sciences, where the journals are chosen on the basis of 2YIF. The application to these 20 ISI categories could be used as a template for other ISI categories in the sciences and social sciences, and as a benchmark for newer journals in a range of ISI disciplines. In addition to evaluating the 6 most highly cited journals in each of 20 ISI categories, the paper also highlights the similarities and differences in alternative RAM, finds that several RAM capture similar performance characteristics for the most highly cited scientific journals, determines that PI-BETA is not highly correlated with the other RAM, and hence conveys additional information regarding research performance. In order to provide a meta analysis summary of the RAM, which are predominantly ratios, harmonic mean rankings are presented of the 13 RAM for the 6 most highly cited journals in each of the 20 ISI categories. It is shown that emphasizing THE impact factor, specifically the 2-year impact factor, of a journal to the exclusion of other informative RAM can lead to a distorted evaluation of journal performance and influence on different disciplines, especially in view of inflated journal self citations.

Keywords: 2Y-Star, Alternative, Analysis, Application, Article Influence, C3PO, Characteristics, Citation, Citations, Cited Article Influence, Data, Database, Eigenfactor, Eigenfactor(TM) Metrics, Evaluation, First, h Index, h-Index, H-Star, IFI, Immediacy, Impact, Impact Factor, Impact Factors, Indexes, Information, ISI, ISI Web of Science, Journal, Journals, Lead, Meta-Analysis, Performance, Pi-Beta, Rankings, Research, Research Assessment Measures (RAM), Research Performance, Science, Sciences, Scientific Journals, Self, Self-Citations, Social, Social Sciences, Template, Web of Science, Zinfluence

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Full Text: [2011\Scientometrics87, 41.pdf](2011/Scientometrics87,%2041.pdf)

Abstract: Ranking of 91 countries based on the Technology Achievement Index 2009 (TAI-09) (2009 refers to the year in which most of data collection was carried out.) is reported. Originally proposed in 2002, the TAI is a composite indicator which aggregates national technological capabilities and performance in terms of creation/diffusion of new technologies, diffusion of old technologies and development of human skills. In addition to the overall ranking of 91 countries, rankings in each sub-dimension of the Index are also reported. Comparative analysis of TAI ranking of 56 countries, common to the present and previous study of 2002 under similar conditions, is quite instructive and indicates shifts in technological scenario of these countries even over a relatively short period of 5-6 years. A simple concept based on Standard Deviation approach, as an indication of the technological spread or otherwise, is proposed for the first time. Application of this concept to 56 common countries is reported.

Keywords: Achievement, Aggregates, Analysis, Approach, Collection, Comparative Study, Composite, Data, Data Collection, Development, Diffusion, First, Human, Human Skills, Index, Indication, Indicator, Nations, Performance, Ranking, Rankings, Scenario, Technologies, Technology Achievement Index, Technology Capability, Technology Capability Spread, Technology Creation, Technology Development, Technology Diffusion

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Full Text: [2011\Scientometrics87, 63.pdf](2011/Scientometrics87,%2063.pdf)

Abstract: This paper offers some insights into scientific collaboration (SC) at the regional level by drawing upon two lines of inquiry. The first involves examining the spatial patterns of university SC across the EU-15 (all countries belonging to the European Union between 1995 and 2004). The second consists of extending the current empirical analysis on regional SC collaboration by including the economic distance between regions in the model along with other variables suggested by the extant literature. The methodology relies on co-publications as a proxy for academic collaboration, and in order to test the relevance of economic distance for the intensity of collaboration between regions, we put forward a gravity equation. The descriptive results show that there are significant differences in the production of academic scientific papers between less-favoured regions and core regions. However, the intensity of collaboration is similar in both types of regions. Our econometric findings suggest that differences in scientific resources (as measured by R&D expenditure) between regions are relevant in explaining academic scientific collaborations, while distance in the level of development (as measured by per capita GDP) does not appear to play any significant role. Nevertheless, other variables in the analysis, including geographical distance, specialization and cultural factors, do yield significant estimated coefficients, and this is consistent with the previous literature on regional SC.

Keywords: Academic Scientific Collaboration, Analysis, Center-Periphery, Co-Authorship, Co-Authorships, Collaboration, Collaborations, Cultural, Development, Economic, Economic Distance, Europe, European Union, First, Gravity Equation, International Collaboration, Literature, Methodology, Model, Papers, Patterns, Proximity, Regional, Relevance, Resources, Role, Science, Scientific Collaboration, University

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Full Text: [2011\Scientometrics87, 75.pdf](2011/Scientometrics87,%2075.pdf)

Abstract: We studied the effect on journal impact factors (JIF) of citations from documents labeled as articles and reviews (usually peer reviewed) versus citations coming from other documents. In addition, we studied the effect on JIF of the number of citing records. This number is usually different from the number of citations. We selected a set of 700 journals indexed in the SCI section of JCR that receive a low number of citations. The reason for this choice is that in these instances some citations may have a greater impact on the JIF than in more highly-cited journals. After excluding some journals for different reasons, our sample consisted of 674 journals. We obtained data on citations that contributed to the JIF for the years 1998-2006. In general, we found that most journals obtained citations that contribute to the impact factor from documents labeled as articles and reviews. In addition, in most of journals the ratio between citations that contributed to the impact factor and citing records was greater than 80% in all years. Thus, in general, we did not find evidence that citations that contributed to the impact factor were dependent on non-peer reviewed documents or only a few citing records.

Keywords: Choice, Citation-Index, Citations, Citing Records, Data, Evidence, General, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journal Impact Factor, Journal Impact Factors, Journals, Labeled Editorial Material, Peer-Reviewed, Records, Reviews, SCI

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Full Text: [2011\Scientometrics87, 85.pdf](2011/Scientometrics87,%2085.pdf)

Abstract: The h-index has received an enormous attention for being an indicator that measures the quality of researchers and organizations. We investigate to what degree authors can inflate their h-index through strategic self-citations with the help of a simulation. We extended Burrell’s publication model with a procedure for placing self-citations, following three different strategies: random self-citation, recent self-citations and h-manipulating self-citations. The results show that authors can considerably inflate their h-index through self-citations. We propose the q-index as an indicator for how strategically an author has placed self-citations, and which serves as a tool to detect possible manipulation of the h-index. The results also show that the best strategy for an high h-index is publishing papers that are highly cited by others. The productivity has also a positive effect on the h-index.

Keywords: Analysis, Authors, h Index, h-Index, Indicator, Manipulation, Model, Papers, Procedure, Productivity, Publication, Publishing, q-Index, Quality, Quality of, Recent, Science, Self-Citation, Self-Citations, Simulation, Stochastic-Model, Strategic, Strategy

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Full Text: [2011\Scientometrics87, 99.pdf](2011/Scientometrics87,%2099.pdf)

Abstract: Bibliometric indicators are increasingly used to fund and evaluate scientific research. Since the number of authors in a paper and the number of has increased it is difficult to determine the individual contribution of authors. Suggested approaches include the study of author position or the corresponding author. Our findings show that the corresponding author is most likely to appear first and then last in the byline. The results are dependent on number of authors in a paper and national differences exist. This underscores the need to take into account both the number of authors on a paper and their position in the byline to be accurate when measuring author contribution.

Keywords: Author Impact, Author Position, Authors, Bibliometric, Bibliometric Indicators, Bibliometric Study, Co-Authorship, Corresponding Author, First, Indicators, Research, Scientific Research, Senior Authors

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Full Text: [2011\Scientometrics87, 107.pdf](2011/Scientometrics87,%20107.pdf)

Abstract: The Hirsch index is a number that synthesizes a researcher’s output. It is defined as the maximum number h such that the researcher has h papers with at least h citations each. Four characterizations of the Hirsch index are suggested. The most compact one relies on the interpretation of the index as providing the number of valuable papers in an output and postulates three axioms. One, only cited papers can be valuable. Two, the index is strongly monotonic: if output x has more papers than output y and each paper in x has more citations than the most cited paper in y, then x has more valuable papers than y. And three, the minimum amount of citations under which a paper becomes valuable is different for each paper.

Keywords: Axiomatic Characterization, Characterizations, Citations, Hirsch, Hirsch Index, Index, Minimum, Papers, Publications, Scientific Productivity Index

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Full Text: [2011\Scientometrics87, 115.pdf](2011/Scientometrics87,%20115.pdf)

Abstract: This study is an attempt to approach the intellectual structure of the stem cell research field 2004-2009 through a comprehensive author co-citation analysis (ACA), and to contribute to a better understanding of a field that has been brought to the forefront of research, therapy and political and public debates, which, hopefully, will in turn better inform research and policy. Based on a nearly complete and clean dataset of stem cell literature compiled from PubMed and Scopus, and using automatic author disambiguation to further improve results, we perform an exclusive all-author ACA of the 200 top-ranked researchers of the field by fractional citation count. We find that, despite the theoretically highly interdisciplinary nature of the field, stem cell research has been dominated by a few central medical research areas-cancer and regenerative medicine of the brain, the blood, the skin, and the heart-and a core of cell biologists trying to understand the nature and the molecular biology of stem cells along with biotechnology researchers investigating the practical identification, isolation, creation, and culturing of stem cells. It is also remarkably self-contained, drawing only on a few related areas of cell biology. This study also serves as a baseline against which the effectiveness of a range of author-based bibliometric methods and indicators can be tested, especially when based on less comprehensive datasets using less optimal analysis methods.

Keywords: All Author Aca, All-Author, Analysis, Approach, Author Co-Citation Analysis, Author Cocitation Analysis, Bibliometric, Bibliometric Methods, Bibliometrics, Biology, Biomedical Research, Biotechnology, Blood, Brain, Citation, Citation Analysis, Co-Citation, Co-Citation Analysis, Cocitation, Effectiveness, Field, Identification, Indicators, Information-Science, Intellectual Structure, Interdisciplinary, Literature, Medical, Medical Research, Medicine, Methods, Molecular Biology, Multidisciplinary, Policy, Public, Publications, Pubmed, Regenerative Medicine, Research, Research Policy, Scholarly Communication, Scholarly Communication, Scientific Collaboration, Scopus, Skin, Stem Cell, Stem Cell Research, Stem Cells, Structure, Therapy, Understanding, Web

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Full Text: [2011\Scientometrics87, 133.pdf](2011/Scientometrics87,%20133.pdf)

Abstract: We study global and local Q-measures, as well as betweenness centrality, as indicators of international collaboration in research. After a brief review of their definitions, we introduce the concepts of external and internal inter-group geodesics. These concepts are applied to a collaboration network of 1129 researchers from different countries, which is based on publications in bibliometrics, informetrics, webometrics, and scientometrics (BIWS in short) from the period 1990-2009. It is thus illustrated how international collaboration (among authors from different countries) in BIWS is carried out. Our results suggest that average scores for local Q-measures are typically higher, indicating a relatively low degree of international collaboration in BIWS. The dominating form of international collaboration is bilateral, whereas multilateral collaboration is relatively rare in the field of BIWS. We also identify and visualize the most important global and local actors. Dividing the entire period in four 5-year periods, it is found that most international collaboration in the field has happened in the last time slice (2005-2009). A comparison of the different time slices reveals the non-linear growth of the indicators studied and the international expansion of the field.

Keywords: Authors, Betweenness, Bibliometrics, Case Study, Co-Author Collaborative Network, Collaboration, Comparison, Disambiguation, Evolvement Of Network, External Inter-Group Geodesic, Field, Global Q-Measure, Globalization, Growth, Indicators, Informetrics, Internal Inter-Group Geodesic, International, Local, Local Q-Measure, Network, Publications, Research, Review, Scientometrics, Webometrics

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Full Text: [2011\Scientometrics87, 149.pdf](2011/Scientometrics87,%20149.pdf)

Abstract: There has been a substantial increase in the percentage for publications with co-authors located in departments from different countries in 12 major journals of psychology. The results are evidence for a remarkable internationalization of psychological research, starting in the mid 1970s and increasing in rate at the beginning of the 1990s. This growth occurs against a constant number of articles with authors from the same country, it is not due to a concomitant increase in the number of co-authors per article. Thus, international collaboration in psychology is obviously on the rise.

Keywords: Authors, Co-Authors, Collaboration, Country, Evidence, Growth, Historical Trend, International, International Collaboration, Internationalization, Journals, Linear Mixed Model, Psychological Publications, Psychology, Publications, Research

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Full Text: [2011\Scientometrics87, 159.pdf](2011/Scientometrics87,%20159.pdf)

Abstract: Nanobiopharmaceuticals is a hopeful research domain from recent scientific advances with massive marketable potential. Although some researchers have studied international collaboration from some aspects, few articles are as comprehensive as this article to consider international cooperation from so many different aspects. We lay more emphasis on international collaboration in the field of nanobiopharmaceuticals involving China. Incremental citation impact values show that in order to move forward and improve the overall competitiveness in the field, China requires to carry out more international collaboration in the field, especially with USA, Germany, and England. Startlingly, multinational collaboration does not sway Chinese citation impact as much as we anticipate in the field. China has reached the first rank in the world in terms of publication amount per year in the field in 2009. Few papers about international collaboration compare small world phenomenon. We use small world quotient to find that it is important for Chinese international co-authors to strengthen to cultivate a cooperation networks in which a node’s partners are also buddies to each other.

Keywords: Advances, China, Chinese, Citation, Citation Impact, Co-Authors, Co-Authorship, Collaboration, Cooperation, Disciplinary, England, Field, First, Germany, Impact, International, International Collaboration, International Cooperation, Nanobiopharmaceuticals, Nanotechnology, Networks, Papers, Potential, Publication, Publications, Rank, Recent, Research, Small, Small World, USA, World

? Rousseau, R. (2011), Comments on the modified collaborative coefficient. *Scientometrics*, **87** (1), 171-174.

Full Text: [2011\Scientometrics87, 171.pdf](2011/Scientometrics87,%20171.pdf)

Abstract: It is shown that the observations made in a recent contribution by Savanur and Srikanth (Scientometrics 84:365-371, 2010) are not new. On the contrary much more refined collaboration measures have been proposed already in 1991 by Egghe.

Keywords: Collaboration, Collaborative Coefficient, Egghe’s Requirements for Collaboration Measures, Modified, Recent, Scale Invariance, Scientometrics

? Zheng, J., Zhao, Z.Y., Zhang, X., Chen, D.Z., Huang, M.H., Lei, X.P., Zhang, Z.Y., Zhao, Y.H. and Liu, R.S. (2011), Industry evolution and key technologies in China based on patent analysis. *Scientometrics*, **87** (1), 175-188.

Full Text: [2011\Scientometrics87, 175.pdf](2011/Scientometrics87,%20175.pdf)

Abstract: Patents are the manifestation of the industry’s research and development (R&D) endeavor, therefore, this paper studies the industry evolution of and key technologies in China from the perspective of patent analysis. Patents in six types of industries, including Chemical (excluding Drugs), Computers and Communications, Drugs and Medical, Electrical and Electronics (E&E), Mechanical, and Others are analyzed in this study. Findings from the analysis show a steady increase of US granted utility patents in China as well as percentage of these patents in the world over the period between 2003 and 2008. All the above industries in China have been growing rapidly during this period, which is very different from the global industry development. Despite the rapid development, the citation rates of these patents have been low, reflecting a need for improvement in the quality of patents and R&D performance for these six industries in China in order to exert more influence in the industry world. The analysis on patents also reveals China’s industry distribution to be similar to the global industry distribution, with the exception of E&E industry which weights over one third of the total patents in technologies. The E&E industry is also the field with largest economic growth which rises more rapidly after 2006 with a sudden increase of patents in USPC 361. Detailed tracking of the key technology evolution reveals that 90% of the newly issued patents in USPC 361 after 2006 are owned by Foxconn Technology Co., Ltd, pointing to an unbalanced R&D environment in China’s E&E industry sector. By providing the insight into the evolution of China’s industrial and technological development through the perspective of patent analysis, this paper hopes to provide an objective statistic reference for future policy directions and academic researches.

Keywords: Analysis, China, Citation, Co, Development, Distribution, E&E, Economic, Environment, Evolution, Field, Germany, Growth, Improvement, Industry Type, Key Technology, Patent, Patent Analysis, Patents, Performance, Policy, Quality, Quality of, Rapid Development, Rates, Reference, Research, Research and Development, Science, Sector, Technologies, Technology, US, USPC 361, Utility, World

? Campanario, J.M. (2011), Empirical study of journal impact factors obtained using the classical two-year citation window versus a five-year citation window. *Scientometrics*, **87** (1), 189-204.

Full Text: [2011\Scientometrics87, 189.pdf](2011/Scientometrics87,%20189.pdf)

Abstract: In this article I study characteristics of the journal impact factor (JIF) computed using a 5-year citation window as compared with the classical JIF computed using a 2-year citation window. Since 2007 ISI-Thomson Reuters has published the new 5-year impact factor in the JCR database. I studied changes in the distribution of JIFs when the citation window was enlarged. The distributions of journals according their 5-year JIFs were very similar all years studied, and were also similar to the distribution according to the 2-year JIFs. In about 72% of journals, the JIF increased when the longer citation window was used. Plots of 5-year JIFs against rank closely followed a beta function with two exponents. Thus, the 5-year JIF seems to behave very similarly to the 2-year JIF. The results also suggest that gains in JIF with the longer citation window tend to distribute similarly in all years. Changes in these gains also tend to distribute similarly from 1 year to the following year.

Keywords: Changes, Characteristics, Citation, Citation Window, Database, Distribution, Function, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journal Impact Factor, Journal Impact Factors, Journals, Quality, Rank, Science

? Fakhree, M.A.A. and Jouyban, A. (2011), Scientometric analysis of the major Iranian medical universities. *Scientometrics*, **87** (1), 205-220.

Full Text: [2011\Scientometrics87, 205.pdf](2011/Scientometrics87,%20205.pdf)

Abstract: Nowadays, scientometrics has become an important field of study to monitor the progresses in scientific performance of a research group, a department, a university etc. A number of scientometrical studies have been done about Iranian scientific outcome in recent years. But there is no comparison between major Iranian medical universities. In this study, by using Scopus as search engine, the scientific outcomes of the Iran University of Medical Sciences, Isfahan University of Medical Sciences, Mashhad University of Medical Sciences, Shahid Beheshti University of Medical Sciences, Shiraz University of Medical Sciences, Tabriz University of Medical Sciences, and Tehran University of Medical Sciences have been compared with each other. These universities were compared by the number of published articles per year, number of citations received per year, number of citations received per year per article, total H-indices, top ten authors, and top ten journals. The results of this study show that the order of the studied universities in research performance is as follow: Tehran > Shiraz = Shahid Beheshti > Isfahan = Iran > Tabriz = Mashhad universities of medical sciences. In addition, the data of Tehran University of Medical Sciences as the top medical university of Iran was compared with some of top medical universities around the world.

Keywords: Analysis, Authors, Citations, Comparison, Data, Engine, Field, Iran, Journals, Medical, Number of Article, Outcome, Outcomes, Performance, Recent, Research, Research Performance, Sciences, Scientific Performance, Scientometric, Scientometrics, Scopus, Universities, University, University of Medical Science, World

? Nakamura, H., Suzuki, S., Hironori, T., Kajikawa, Y. and Sakata, I. (2011), Citation lag analysis in supply chain research. *Scientometrics*, **87** (2), 221-232.

Full Text: [2011\Scientometrics87, 221.pdf](2011/Scientometrics87,%20221.pdf)

Abstract: Interdisciplinary research is expected to contribute to industrial and economic development. However, due to expansion of knowledge and the fragmentation of research fields, knowledge dissemination among different research fields is rare and we need a methodology for measuring such dissemination and promoting it. In this paper, we introduce a citation lag analysis of inter- and intra-clusters extracted by citation network analysis as a new indicator to represent the speed of knowledge diffusion in subfields of a research field. A case study was performed within supply chain research to investigate knowledge integration among its subfields. Based on the analysis, we discuss knowledge structure and reciprocal influence of subfields in supply chain research. This study contributes to offering a new approach for analyzing and understanding the development of boundary spanning research.

Keywords: Agile, Analysis, Approach, Boundary Spanning, Case Study, Citation, Citation Network, Coordination, Demand Uncertainty, Development, Diffusion, Economic, Economic Development, Field, Fragmentation, Indicator, Information, Integration, Interdisciplinarity, Interdisciplinary, Knowledge, Knowledge Diffusion, Management, Methodology, Network, Network Analysis, Product, Research, Research on Research, Science, Structure, Supply Chain, Technology, Understanding

? Sobkowicz, P. (2011), Simulations of opinion changes in scientific communities. *Scientometrics*, **87** (2), 233-250.

Full Text: [2011\Scientometrics87, 233.pdf](2011/Scientometrics87,%20233.pdf)

Abstract: We present a computer model of opinion changes in a scientific community. The study takes into account two mechanisms of opinion formation for individual scientists: influence of coworkers with whom there is direct interaction and cumulative influence of the subject literature. We analyze the evolution of relative popularity of different competing theories, depending on their accuracy in describing observed phenomena and on current social support of the theory. We include such aspects as finite lifetime of publication impact and tendency to ‘defend’ one’s own opinions, especially if they were already published. A special class of publications, delivering crucial observational or experimental data, which may revolutionize the scientific worldview is considered. The goal of the model is to discover which conditions lead to quick domination of one theory over others, or, conversely, in which situations one may expect several explanations to co-exist.

Keywords: Accuracy, Agent Based Societies, Article Decay, Bells Theorem, Changes, Community, Cumulative, Data, Evolution, Experimental, Experimental Tests, Impact, Information, Interaction, Lead, Literature, Mechanisms, Metascience, Model, Models, Networks, Observational, Opinion Formation, Opinions, Publication, Publications, Quantum-Mechanics, Selective Exposure, Social, Social Simulations, Social Support, Support, Theory

? Gazni, A. and Didegah, F. (2011), Investigating different types of research collaboration and citation impact: A case study of Harvard University’s publications. *Scientometrics*, **87** (2), 251-265.

Full Text: [2011\Scientometrics87, 251.pdf](2011/Scientometrics87,%20251.pdf)

Abstract: This study aims to investigate the influence of different patterns of collaboration on the citation impact of Harvard University’s publications. Those documents published by researchers affiliated with Harvard University in WoS from 2000-2009, constituted the population of the research which was counted for 124,937 records. Based on the results, only 12% of Harvard publications were single author publications. Different patterns of collaboration were investigated in different subject fields. In all 22 examined fields, the number of co-authored publications is much higher than single author publications. In fact, more than 60% of all publications in each field are multi-author publications. Also, the normalized citation per paper for co-authored publications is higher than that of single author publications in all fields. In addition, the largest number of publications in all 22 fields were also published through inter-institutional collaboration and were as a result of collaboration among domestic researchers and not international ones. In general, the results of the study showed that there was a significant positive correlation between the number of authors and the number of citations in Harvard publications. In addition, publications with more number of institutions have received more number of citations, whereas publications with more number of foreign collaborators were not much highly cited.

Keywords: Authors, Case Study, Citation, Citation Impact, Citations, Collaboration, Collaboration Patterns, Correlation, Field, General, Harvard University, Impact, Institutions, International, International Scientific Collaboration, Model, Population, Publications, Quality, Records, Research, Research Collaboration, University

? Khan, G.F., Moon, J., Park, H.W., Swar, B. and Rho, J.J. (2011), A socio-technical perspective on e-government issues in developing countries: A scientometrics approach. *Scientometrics*, **87** (2), 267-286.

Full Text: [2011\Scientometrics87, 267.pdf](2011/Scientometrics87,%20267.pdf)

Abstract: Many researchers have analyzed e-government literature as a whole or a specific area to focus on statistical methodologies, lessons learnt, or problem related to the area. However, no investigation from socio-technical perspective on e-government issues, in developing countries (DCs), has been carried out. Utilizing scientometrics approach, we analyzed and synthesized e-government (EG) literature that deals with the issues/topics in developing countries from the lens of socio-technical theory (STT). 145 articles from 7 core e-government journals published during the last decade were selected and reviewed for analyzing e-government literature related to developing countries. The growth pattern of e-government literature showed that e-government studies pertaining developing countries issues/topics have rapidly increased during the last decade, covering a range of topics/issues studied from socio-technical aspects. We found that e-government literature in developing countries has somewhat adopted a balanced approach and is moving away from a merely theoretical or conceptual bases toward an empirical foundation, however, the literature lacked depth and balance in terms of issues/topics discussed and methodologies applied. In the light of the findings, strengths, limitations, and future directions for e-government research in developing countries are discussed.

Keywords: Africa, Approach, Challenges, Core E-Government Journals, Developing, Developing Countries, E-Government Issues, Topics, E-Government Research, Growth, Investigation, Journals, Lessons, Literature, Methodologies, Pattern, Research, Scientometrics, Scientometrics Approach, Sector, Shape of E-Government Literature, Socio-Technical Theory, Systems, Theory

? Egghe, L. (2011), Mathematical derivation of the scale-dependence of the h-index and other h-type indices. *Scientometrics*, **87** (2), 287-292.

Full Text: 2011\Scientometrics87, 287.pdf

Abstract: We present a mathematical derivation of the scale-dependence of the h-index. This formula can be used in two cases: one where the units are scale-dependent and one where the units are not scale-dependent. Examples are given.

Keywords: h Index, h-Index, h-Type Index, Hirsch-Index, Indices, Scale

? Fang, H. (2011), Peer review and over-competitive research funding fostering mainstream opinion to monopoly. *Scientometrics*, **87** (2), 293-301.

Full Text: [2011\Scientometrics87, 293.pdf](2011/Scientometrics87,%20293.pdf)

Abstract: The aim of peer review is to separate the wheat from the chaff for publication and research funding. In the excessive competition, this mechanism would only select the wheat of mainstream. Up to now, almost all discussions on the consequence of the short-comings of peer review are limited to qualitatively description. I propose a model of “peer-group-assessed-grant-based-funding-system” combined with tenure system and over-competitive research funding review process. It is the first on the quantitatively investigation which dramatizes the current short-comings of the process. My simulation shows that it takes about two or three generations of researchers for the mainstream of a complicated research topic obtaining monopoly supremacy, with only the aid of the mechanism the model described. Based on the computation results, suggestions are proposed to avoid loss of self-correction capability on popularity determined single research direction which could be wrong on very complicated research topics.

Keywords: Competition, Computation, Excessive Competition, First, Funding, Innovation, Investigation, Mainstream, Mathematical Model, Mechanism, Model, Peer Review, Peer-Review, Publication, Research, Research Funding, Review, Review Process, Simulation, Tenure

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Full Text: [2011\Scientometrics87, 303.pdf](2011/Scientometrics87,%20303.pdf)

Abstract: Data from 1,581 faculty members affiliated with 98 doctoral-granting Communication programs in the United States were analyzed to determine normative publication rates and predictors of position centrality in the faculty hiring network. The Communication Institute for Online Scholarship (CIOS) database was used to measure publication frequency in refereed journals. Position centrality was measured using a Communication program’s relative position in the hiring network as established by Barnett, Danowski, Feeley, and Stalker (2010). The average publication frequencies by academic rank were as follows: assistant professors averaged 2.29 articles (N = 441, SD = 3.29), associate professors averaged 6.69 articles (N = 497, SD = 5.77), professors averaged 10.92 articles (N = 542, SD = 12.09). Results from multiple regression analyses indicate the number of publications for faculty members and position centrality of where one earned his or her doctoral degree significantly predicted current position centrality. Publication numbers for one’s advisor and year of earned doctorate did not emerge as significant predictors of position centrality.

Keywords: Advisor, Analyses, Centrality, Communication, Database, Education, Faculty, Hiring, Journals, Measure, Multiple Regression, N, Network, Networks, Ph.D.S, Placement, Political-Science, Predictors, Publication, Publications, Rank, Rates, Regression, Research Productivity, Speech-Communication, United States

? Onyancha, O.B. and Maluleka, J.R. (2011), Knowledge production through collaborative research in sub-Saharan Africa: How much do countries contribute to each other’s knowledge output and citation impact? *Scientometrics*, **87** (2), 315-336.

Full Text: [2011\Scientometrics87, 315.pdf](2011/Scientometrics87,%20315.pdf)

Abstract: This paper examines co-authorship of research articles in Thomson Reuters citation indexes in order to assess knowledge co-production in selected sub-Saharan African countries. Two indicators, namely publications and citations, were analysed to establish the patterns of knowledge co-production and its scientific impact, respectively. The study found that knowledge production through collaborative research among sub-Saharan African countries is minimal and contributes only a small percentage when compared to collaboration between sub-Saharan African countries and their foreign counterparts. Similarly, the scientific impact of international collaboration was higher than that of continental collaboration. Countries belonging to the same geographic region contributed to each other’s knowledge production more frequently than they did to the countries outside their region. It is recommended that, for knowledge co-production in sub-Saharan Africa to improve, various measures such as encouraging student and staff exchange, hosting more regional conferences and encouraging research networks need to be put in place.

Keywords: Africa, Citation, Citation Impact, Citation Indexes, Citations, Co-Authorship, Coauthorship, Collaboration, Collaborative Research, Conferences, Impact, Indicators, International, Knowledge, Knowledge Production, Networks, Patterns, Publications, Region, Regional, Research, Research Collaboration, Science, Scientific Impact, Sector, Small, Student, Sub-Saharan Africa, Thomson-Reuters, Universities

? Breimer, L.H. and Leksell, J. (2011), Longitudinal and cross-sectional study of registered nurses in Sweden who undertake a PhD showing that nurses continue to publish in English after their PhD but male nurses are more productive than female nurses. *Scientometrics*, **87** (2), 337-345.

Full Text: [2011\Scientometrics87, 337.pdf](2011/Scientometrics87,%20337.pdf)

Abstract: A review of 649 PhDs undertaken by Swedish nurses and midwives found no evidence that they stop publishing in English after their PhD. The proportion of 70% for any publication in English was similar to that of MDs. A higher proportion of male than female nurses were high publishers of six or more (52% vs. 23%) and eight or more papers (44% vs. 14%) in a 5 year period. The standard of the PhDs of Swedish nurses was comparable to those of other biomedical PhDs and was consistent in pattern over the past two decades. The gender pattern of external examiners of female nurses evolved in that 1992-94, 75% were men, during 1996-97, 54% were men and from 2000 onwards 46% were men. Nurses were examined by foreign examiners in 20% of examinations. They came primarily from Norway and USA.

Keywords: Biomedical, Demographics, Evidence, External Examiners, Female, Gender, Gender Differences, Male, Men, Midwives, Norway, Nurses, Nurses And Midwives, Papers, Pattern, Phd, Publication, Publication Pattern, Publishing, Review, Standard, Sweden, Thesis, USA

? Larcombe, A.N. and Voss, S.C. (2011), Self-citation: comparison between Radiology, European Radiology and Radiology for 1997-1998. *Scientometrics*, **87** (2), 347-356.

Full Text: [2011\Scientometrics87, 347.pdf](2011/Scientometrics87,%20347.pdf)

Abstract: This study investigates the incidence of self-citation (authors citing their own work) for scholarly articles in ten journals published by the American Physiological Society. We analysed authorship and referencing practices of all original research articles published in the first ordinary issue of each journal in both 2000 and 2010, comprising 271 and 212 articles, respectively. Self-citation is common in these journals and represents a total of 17.75% of all citations. Only 9 (1.86%) of the articles analysed did not self-cite. Author position significantly influenced the rate of self-citation with last authors being self-cited significantly more than any other author. This was likely a result of the cumulative nature of scientific research within a specific discipline and the necessary desire to promote ones own work for associated academic benefit. The country in which the work was conducted also influenced the rate of self-citation, with last authors based in North America self-citing more than last authors from Asian countries. A comparison of self-citation rates between decades (2000 and 2010) revealed an increase in the number of authors and number of citations per article between 2000 and 2010, however the mean percentage of self-cited articles did not differ between the years. Finally, there were no differences in the percentage of self-citation between the different journals analysed.

Keywords: American Physiological Society Journals, Asian, Author Position, Authors, Authorship, Bibliometric Analysis, Citations, Comparison, Country, Cumulative, First, Impact, Incidence, Journal, Journals, Macro, North, North America, Practices, Rates, Referencing, Research, Scientific Research, Self-Citation, Work

? Sandor, S. and George, K. (2011), Towards a typology of research performance diversity: The case of top Hungarian players. *Scientometrics*, **87** (2), 357-371.

Full Text: [2011\Scientometrics87, 357.pdf](2011/Scientometrics87,%20357.pdf)

Abstract: Measuring the intellectual diversity encoded in publication records as a proxy to the degree of interdisciplinarity has recently received considerable attention in the science mapping community. The present paper draws upon the use of the Stirling index as a diversity measure applied to a network model (customized science map) of research profiles, proposed by several authors. A modified version of the index is used and compared with the previous versions on a sample data set in order to rank top Hungarian research organizations (HROs) according to their research performance diversity. Results, unexpected in several respects, show that the modified index is a candidate for measuring the degree of polarization of a research profile. The study also points towards a possible typology of publication portfolios that instantiate different types of diversity.

Keywords: Authors, Community, Data, Diversity, Diversity Index, Hungary, Index, Interdisciplinarity, Isi Subject Categories, Mapping, Measure, Model, Modified, Network, Performance, Polarization Index, Profiles, Publication, Rank, Records, Research, Research Organizations, Research Performance, Science, Science Mapping, Version

? Small, H. (2011), Interpreting maps of science using citation context sentiments: A preliminary investigation. *Scientometrics*, **87** (2), 373-388.

Full Text: [2011\Scientometrics87, 373.pdf](2011/Scientometrics87,%20373.pdf)

Abstract: It is proposed that citation contexts, the text surrounding references in scientific papers, be analyzed in terms of an expanded notion of sentiment, defined to include attitudes and dispositions toward the cited work. Maps of science at both the specialty and global levels are used as the basis of this analysis. Citation context samples are taken at these levels and contrasted for the appearance of cue word sets, analyzed with the aid of methods from corpus linguistics. Sentiments are shown to vary within a specialty and can be understood in terms of cognitive and social factors. Within-specialty and between-specialty co-citations are contrasted and in some cases suggest a correlation of sentiment with structural location. For example, the sentiment of “uncertainty” is important in interdisciplinary co-citation links, while “utility” is more prevalent within the specialty. Suggestions are made for linking sentiments to technical terms, and for developing sentiment “baselines” for all of science.

Keywords: 2 Disciplines, Analysis, Attitudes, Citation, Citation Contexts, Clusters, Co-Citation, Cocitation, Context, Corpus Linguistics, Correlation, Developing, Global, Interdisciplinary, Investigation, Location, Maps Of Science, Methods, Notion, Papers, References, Science, Sentiment Analysis, Social, Specialty, Work

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Full Text: [2011\Scientometrics87, 389.pdf](2011/Scientometrics87,%20389.pdf)

Abstract: This paper describes and analyses the role played in the development of bibliometric indicators-and the use made of bibliometric indicators for policy purposes-by the European Commission’s Directorate-General Research in the period 1990-2005.

Keywords: Analyses, Bibliometric, Bibliometric Indicators, Development, European Commission, European Paradox, European Research Area, Evaluation, Excellence, Framework Programme, Indicators, Policy, Research, Research Policy, Role

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Full Text: [2011\Scientometrics87, 399.pdf](2011/Scientometrics87,%20399.pdf)

Abstract: Research policies in the more developed nations are ever more oriented towards the introduction of productivity incentives and competition mechanisms intended to increase efficiency in research institutions. Assessments of the effects of these policy interventions on public research activity often neglect the normal, inherent variation in the performance of research institutions over time. In this work, we propose a cross-time bibliometric analysis of research performance by all Italian universities in two consecutive periods (2001-2003 and 2004-2008) not affected by national policy interventions. Findings show that productivity and impact increased at the level of individual scientists. At the level of university, significant variation in the rank was observed.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometrics, Competition, Cross-Time Analysis, Effects, Efficiency, Impact, Incentives, Institutions, Interventions, Mechanisms, National Scale, Nations, Neglect, Normal, Performance, Policies, Policy, Productivity, Public, Rank, Research, Research Assessment, Research Institutions, Research Performance, Research Productivity, Universities, University, Work

? Glänzel, W., Schubert, A., Thijs, B. and Debackere, K. (2011), A priori vs. a posteriori normalisation of citation indicators. The case of journal ranking. *Scientometrics*, **87** (2), 415-424.

Full Text: [2011\Scientometrics87, 415.pdf](2011/Scientometrics87,%20415.pdf)

Abstract: Two paradigmatic approaches to the normalisation of citation-impact measures are discussed. The results of the mathematical manipulation of standard indicators such as citation means, notably journal Impact Factors, (called a posteriori normalisation) are compared with citation measures obtained from fractional citation counting (called a priori normalisation). The distributions of two subfields of the life sciences and mathematics are chosen for the analysis. It is shown that both methods provide indicators that are useful tools for the comparative assessment of journal citation impact.

Keywords: Analysis, Assessment, Characteristic Scores And Scales, Charts, Citation, Citation Measures, Immediacy Index, Impact, Impact Factor, Indicators, Journal, Journal Impact Measures, Journal Ranking, Life, Life Sciences, Methods, Normalisation, Output, Ranking, Relative Indicators, Research Performance, Sciences, Standard

? Tsai, H.H. (2011), Research trends analysis by comparing data mining and customer relationship management through bibliometric methodology. *Scientometrics*, **87** (3), 425-450.

Full Text: [2011\Scientometrics87, 425.pdf](2011/Scientometrics87,%20425.pdf)

Abstract: There are few comprehensive studies and categorization schemes to discuss the characteristics for both data mining and customer relationship management (CRM) although they have already become more important recently. Using a bibliometric approach, this paper analyzes data mining and CRM research trends from 1989 to 2009 by locating headings “data mining” and “customer relationship management” or “CRM” in topics in the SSCI database. The bibliometric analytical technique was used to examine these two topics in SSCI journals from 1989 to 2009, we found 1181 articles with data mining and 1145 articles with CRM. This paper implemented and classified data mining and CRM articles using the following eight categories-publication year, citation, country/territory, document type, institute name, language, source title and subject area-for different distribution status in order to explore the differences and how data mining and CRM technologies have developed in this period and to analyze data mining and CRM technology tendencies under the above result. Also, the paper performs the K-S test to check whether the analysis follows Lotka’s law. The research findings can be extended to investigate author productivity by analyzing variables such as chronological and academic age, number and frequency of previous publications, access to research grants, job status, etc. In such a way characteristics of high, medium and low publishing activity of authors can be identified. Besides, these findings will also help to judge scientific research trends and understand the scale of development of research in data mining and CRM through comparing the increases of the article author. Based on the above information, governments and enterprises may infer collective tendencies and demands for scientific researcher in data mining and CRM to formulate appropriate training strategies and policies in the future. This analysis provides a roadmap for future research, abstracts technology trends and facilitates knowledge accumulations so that data mining and CRM researchers can save some time since core knowledge will be concentrated in core categories. This implies that the phenomenon “success breeds success” is more common in higher quality publications.

Keywords: Bibliometric Methodology, Crm, Customer Relationship Management, Data Mining, Framework, Impact, Implementation, Knowledge, Lotka Law, Neural-Networks, Perspective, Research Trend Analysis, Scientific Productivity

? Furukawa, T., Shirakawa, N. and Okuwada, K. (2011), Quantitative analysis of collaborative and mobility networks. *Scientometrics*, **87** (3), 451-466.

Full Text: [2011\Scientometrics87, 451.pdf](2011/Scientometrics87,%20451.pdf)

Abstract: This study proposes a quantitative analysis of researcher mobility (i.e. transfer from one institution to another) and collaborative networks on the basis of author background data extracted from biographical notes in scientific articles to identify connections that are not revealed via simple co-authorship analysis. Using a top-ranked journal in the field of computer vision, we create a layered network that describes various aspects of author backgrounds, demonstrating a geographical distribution of institutions. We classify networks according to various dimensions including authors, institutions and countries. The results of the quantitative analysis indicate that mobility networks extend beyond the typical collaborative networks describing institutional and international relationships. We also discuss sectoral collaboration considering the mobility networks. Our findings indicate a limitation of collaborative analysis based on bibliometric data and the importance of tracing researcher mobility within potential networks to identify the true nature of scientific collaboration.

Keywords: Author Backgrounds, Centrality, Co-Author Networks, Coauthorship Networks, Collaborative Networks, Evolution, Industry, Innovation, Journal, Knowledge, Researcher Mobility, Scientific Collaboration, Scientific Collaboration, Social Network, Technology, Triple-Helix

? Waltman, L., van Eck, N.J., van Leeuwen, T.N., Visser, M.S. and van Raan, A.F.J. (2011), Towards a new crown indicator: An empirical analysis. *Scientometrics*, **87** (3), 467-481.

Full Text: [2011\Scientometrics87, 467.pdf](2011/Scientometrics87,%20467.pdf)

Abstract: We present an empirical comparison between two normalization mechanisms for citation-based indicators of research performance. These mechanisms aim to normalize citation counts for the field and the year in which a publication was published. One mechanism is applied in the current so-called crown indicator of our institute. The other mechanism is applied in the new crown indicator that our institute is currently exploring. We find that at high aggregation levels, such as at the level of large research institutions or at the level of countries, the differences between the two mechanisms are very small. At lower aggregation levels, such as at the level of research groups or at the level of journals, the differences between the two mechanisms are somewhat larger. We pay special attention to the way in which recent publications are handled. These publications typically have very low citation counts and should therefore be handled with special care.

Keywords: Bibliometric Indicator, Charts, Citation, Citation Impact, Crown Indicator, Field, Journals, Normalization, Relative Indicators, Research Performance

? Larivière, V., Vignola-Gagné, E., Villeneuve, C., Gélinas, P. and Gingras, Y. (2011), Sex differences in research funding, productivity and impact: An analysis of Quebec university professors. *Scientometrics*, **87** (3), 483-498.

Full Text: [2011\Scientometrics87, 483.pdf](2011/Scientometrics87,%20483.pdf)

Abstract: Using the entire population of professors at universities in the province of Quebec (Canada), this article analyzes the relationship between sex and research funding, publication rates, and scientific impact. Since age is an important factor in research and the population pyramids of men and women are different, the role of age is also analyzed. The article shows that, after they have passed the age of about 38, women receive, on average, less funding for research than men, are generally less productive in terms of publications, and are at a slight disadvantage in terms of the scientific impact (measured by citations) of their publications. Various explanations for these differences are suggested, such as the more restricted collaboration networks of women, motherhood and the accompanying division of labour, women’s rank within the hierarchy of the scientific community and access to resources as well as their choice of research topics and level of specialization.

Keywords: Age, Bibliometric Indicators, Canada, Collaboration, Collaboration, Gender-Differences, Humanities, Output, Publication Productivity, Quebec, Research Funding, Research Impact, Research Productivity, Scientific Productivity, Sex, Social-Sciences, Specialization, Universities, Visibility

? Abramo, G. and D’Angelo, C.A. (2011), Evaluating research: From informed peer review to bibliometrics. *Scientometrics*, **87** (3), 499-514.

Full Text: [2011\Scientometrics87, 499.pdf](2011/Scientometrics87,%20499.pdf)

Abstract: National research assessment exercises are becoming regular events in ever more countries. The present work contrasts the peer-review and bibliometrics approaches in the conduct of these exercises. The comparison is conducted in terms of the essential parameters of any measurement system: accuracy, robustness, validity, functionality, time and costs. Empirical evidence shows that for the natural and formal sciences, the bibliometric methodology is by far preferable to peer-review. Setting up national databases of publications by individual authors, derived from Web of Science or Scopus databases, would allow much better, cheaper and more frequent national research assessments.

Keywords: Bibliometrics, Decision Support Systems, Indicators, Peer Review, Research Assessment, Research Productivity

? Prathap, G. (2011), The Energy-Exergy-Entropy (or EEE) sequences in bibliometric assessment. *Scientometrics*, **87** (3), 515-524.

Full Text: [2011\Scientometrics87, 515.pdf](2011/Scientometrics87,%20515.pdf)

Abstract: Bibliometric research assessment has matured into a quantitative phase using more meaningful measures and analogies. In this paper, we propose a thermodynamic analogy and introduce what are called the energy, exergy and entropy terms associated with a bibliometric sequence. This can be displayed as time series (variation over time), or in event terms (variation as papers are published) and also in the form of phase diagrams (energy-exergy-entropy representations). It is exergy which is the most meaningful single number scalar indicator of a scientist’s performance while entropy then becomes a measure of the unevenness (disorder) of the publication portfolio.

Keywords: Bibliometrics, Energy, Entropy, Exergy, Index, P-Index, S = E - X, X = Ic

? Bjurstrom, A. and Polk, M. (2011), Climate change and interdisciplinarity: A co-citation analysis of IPCC Third Assessment Report. *Scientometrics*, **87** (3), 525-550.

Full Text: [2011\Scientometrics87, 525.pdf](2011/Scientometrics87,%20525.pdf)

Abstract: This study addresses whether interdisciplinarity is a prominent feature of climate research by means of a co-citation analysis of the IPCC Third Assessment Report. The debate on interdisciplinarity and bibliometric measures is reviewed to operationalize the contested notion of interdisciplinarity. The results, based on 6417 references of the 96 most frequently used journals, demonstrate that the IPCC assessment of climate change is best characterized by its multidisciplinarity where the physical, biological, bodily and societal dimensions are clearly separated. Although a few fields and journals integrate a wide variety of disciplines, integration occurs mainly between related disciplines (narrow interdisciplinarity) which indicate an overall disciplinary basis of climate research. It is concluded that interdisciplinarity is not a prominent feature of climate research. The significance of this finding is explored, given that the problem scope of climate change necessitates interdisciplinarity. Ways to promote interdisciplinarity are suggested by way of conclusion.

Keywords: Bibliometrics, Climate Research, Disciplines, Global Environmental-Change, Interdisciplinary, Intergovernmental Panel, International Collaboration, IPCC, Knowledge, Multidisciplinary, Nanotechnology, Networks, Science, Sustainable Development, Transdisciplinarity

? Chuang, K.Y., Wang, M.H. and Ho, Y.S. (2011), High-impact papers presented in the subject category of water resources in the essential science indicators database of the institute for scientific information. *Scientometrics*, **87** (3), 551-562.

Full Text: [2011\Scientometrics87, 551.pdf](2011/Scientometrics87,%20551.pdf), [2011\Scientometrics-Chuang-1.pdf](2011/Scientometrics-Chuang-1.pdf), [2011\Scientometrics-Chuang.pdf](2011/Scientometrics-Chuang.pdf)

Abstract: The Essential Science Indicators (ESI) database is widely used to evaluate institutions and researchers. The objective of this study was to analyze trends and characteristics of papers in the subject category of water resources in the ESI database of the Institute for Scientific Information (ISI). Distributions of document type, language of publication, scientific output, and publication of journals are reported in this article. Five indicators (the number and ranking of total papers, first-author papers, correspondingauthor papers, independent papers, and collaborative papers) were applied to evaluate country, institute, and author performances. In addition, the numbers of authors cited, numbers of institutes cited, numbers of countries cited, and numbers of subject areas cited were also used to evaluate ESI papers. Results showed that 265 papers, all written in English, were listed in 27 journals in the field of water resources. A review paper was more likely to be included in the ESI than a research paper. Journal of Hydrology published the most papers. The USA and UK were the two leading nations. ESI papers published in the US were more likely to involve inter-institutional collaboration than papers published in the UK. The University of Arizona was the most productive institute. Some papers that were almost excluded from the ESI database appear to have consistently received annual high frequencies of citation. Perhaps the 10 year criterion for inclusion in the ESI should be reassessed.

Keywords: Bibliometric Analysis, Biosorption, Citation Analysis, Climate-Change, ESI, European-Union, Hirsch-Index, Indicators, Journals, Model, Number of Countries Cited, Number of Institutes Cited, Number of Subject Areas Cited, Research Performance, Trends

? Wang, J. and Shapira, P. (2011), Funding acknowledgement analysis: An enhanced tool to investigate research sponsorship impacts: the case of nanotechnology. *Scientometrics*, **87** (3), 563-586.

Full Text: [2011\Scientometrics87, 563.pdf](2011/Scientometrics87,%20563.pdf)

Abstract: There is increasing interest in assessing how sponsored research funding influences the development and trajectory of science and technology. Traditionally, linkages between research funding and subsequent results are hard to track, often requiring access to separate funding or performance reports released by researchers or sponsors. Tracing research sponsorship and output linkages is even more challenging when researchers receive multiple funding awards and collaborate with a variety of differentially-sponsored research colleagues. This article presents a novel bibliometric approach to undertaking funding acknowledgement analysis which links research outputs with their funding sources. Using this approach in the context of nanotechnology research, the article probes the funding patterns of leading countries and agencies including patterns of cross-border research sponsorship. We identify more than 91,500 nanotechnology articles published worldwide during a 12-month period in 2008-2009. About 67% of these publications include funding acknowledgements information. We compare articles reporting funding with those that do not (for reasons that may include reliance on internal core-funding rather than external awards as well as omissions in reporting). While we find some country and field differences, we judge that the level of reporting of funding sources is sufficiently high to provide a basis for analysis. The funding acknowledgement data is used to compare nanotechnology funding policies and programs in selected countries and to examine their impacts on scientific output. We also examine the internationalization of research funding through the interplay of various funding sources at national and organizational levels. We find that while most nanotechnology funding is nationally-oriented, internationalization and knowledge exchange does occur as researchers collaborate across borders. Our method offers a new approach not only in identifying the funding sources of publications but also in feasibly undertaking large-scale analyses across scientific fields, institutions and countries.

Keywords: Basic Research, Bibliometrics, Citation, Funding, Funding Acknowledgement Analysis, Grants, Information-Science, Money, Nanotechnology, Publications, Research Funding, Research Outputs, Research Sponsorship

? Jeremic, V., Bulajic, M., Martic, M. and Radojicic, Z. (2011), A fresh approach to evaluating the academic ranking of world universities. *Scientometrics*, **87** (3), 587-596.

Full Text: [2011\Scientometrics87, 587.pdf](2011/Scientometrics87,%20587.pdf)

Abstract: The aim of this article is to present new ideas in evaluating Shanghai University’s Academic Ranking of World Universities (ARWU). One issue frequently put forth in various publications is that the Shanghai rankings are sensitive to the relative weight they attribute to each variable. As a possible remedy to this issue, the statistical I-distance method is proposed to be used. Based on a sample containing the top 100 ranked universities, the results show a significant correlation with the official ARWU list. However, some inconsistencies concerning European universities have been noticed and elaborated upon.

Keywords: Arwu, Classification, Fatal Attraction, Ranking Of Universities, Statistical Methods, The I-Distance Method, Universities

? Cabanac, G. (2011), Accuracy of inter-researcher similarity measures based on topical and social clues. *Scientometrics*, **87** (3), 597-620.

Full Text: [2011\Scientometrics87, 597.pdf](2011/Scientometrics87,%20597.pdf)

Abstract: Scientific literature recommender systems (SLRSs) provide papers to researchers according to their scientific interests. Systems rely on inter-researcher similarity measures that are usually computed according to publication contents (i.e., by extracting paper topics and citations). We highlight two major issues related to this design. The required full-text access and processing are expensive and hardly feasible. Moreover, clues about meetings, encounters, and informal exchanges between researchers (which are related to a social dimension) were not exploited to date. In order to tackle these issues, we propose an original SLRS based on a threefold contribution. First, we argue the case for defining inter-researcher similarity measures building on publicly available metadata. Second, we define topical and social measures that we combine together to issue socio-topical recommendations. Third, we conduct an evaluation with 71 volunteer researchers to check researchers’ perception against socio-topical similarities. Experimental results show a significant 11.21% accuracy improvement of socio-topical recommendations compared to baseline topical recommendations.

Keywords: Combining Full-Text, Experiment, Human Perception, Index, Information-Retrieval, Literature, Literature Review, Measurement, Network Analysis, Perception, Recommendation, Recommender Systems, Similarity Among Researchers, Small-World Problem, Social Clues, Topical Clues

? Todeschini, R. (2011), The j-index: A new bibliometric index and multivariate comparisons between other common indices. *Scientometrics*, **87** (3), 621-639.

Full Text: [2011\Scientometrics87, 621.pdf](2011/Scientometrics87,%20621.pdf)

Abstract: A new bibliometric index is proposed, trying to preserve the advantages of the h-index and to overcome its disadvantages. Multivariate comparisons among 18 bibliometric indices are performed by using Hasse Diagram Technique (HDT) and Principal Component Analysis (PCA). The comparisons were performed on some artificial data sets, three of them well known in literature. The obtained results seems to highlight some interesting properties of the new index and also reveals some relevant relationships among the considered bibliometric indices.

Keywords: Bibliometric Indices, h-Index, h-Index, Hasse Diagrams, J-Index, Literature, Output, PCA

? Abramo, G., Cicero, T. and D’Angelo, C.A. (2011), The dangers of performance-based research funding in non-competitive higher education systems. *Scientometrics*, **87** (3), 641-654.

Full Text: [2011\Scientometrics87, 641.pdf](2011/Scientometrics87,%20641.pdf)

Abstract: An increasing number of nations allocate public funds to research institutions on the basis of rankings obtained from national evaluation exercises. Therefore, in non-competitive higher education systems where top scientists are dispersed among all the universities, rather than concentrated among a few, there is a high risk of penalizing those top scientists who work in lower-performance universities. Using a 5 year bibliometric analysis conducted on all Italian universities active in the hard sciences from 2004 to 2008, this work analyzes the distribution of publications and relevant citations by scientists within the universities, measures the research performance of individual scientists, quantifies the intensity of concentration of top scientists at each university, provides performance rankings for the universities, and indicates the effects of selective funding on the top scientists of low-ranked universities.

Keywords: Bibliometric Analysis, Bibliometrics, Italy, Performance Variability, Performance-Based Research Funding, Research Assessment Exercises, Top Scientists, University, University-Research

? Czerwon, H.J. (2011), Jan Vlachy (1937-2010) Obituary. *Scientometrics*, **87** (3), 655-656.

Full Text: [2011\Scientometrics87, 655.pdf](2011/Scientometrics87,%20655.pdf)

? Ortega, J.L. (2011), Collaboration patterns in patent networks and their relationship with the transfer of technology: The case study of the CSIC patents. *Scientometrics*, **87** (3), 657-666.

Full Text: [2011\Scientometrics87, 657.pdf](2011/Scientometrics87,%20657.pdf)

Abstract: The aim of this article is to observe differences between research areas when it comes to establish collaboration ties with local, national or international partners. It also intends to determine in what extent the collaboration can influence the patent transfer. A collaboration network between CSIC researchers and their external collaborators was built. Several statistical tests were used to find significant differences between research areas. A multiple regression model was also utilized in order to know what type of collaboration is more successful to transfer a patent. The results show that there are two well defined groups. A “Bio” group with a high international collaboration pattern but less national participation, and a “Physicist” group supported by a high proportion of national partners but with few international connections. The regression analysis found that the national collaboration is the variable that most increase the patent transfer.

Keywords: Collaboration, Collaboration Pattern, Exploration, Multiple Regression Model, Patent Licensing, Research Areas, Scientometrics

? Geraci, M. and Esposti, M. (2011), Where do Italian universities stand? An in-depth statistical analysis of national and international rankings. *Scientometrics*, **87** (3), 667-681.

Full Text: [2011\Scientometrics87, 667.pdf](2011/Scientometrics87,%20667.pdf)

Abstract: In a previous article (Degli Esposti and Geraci. Bulletin of Italian Politics, 2011), we presented an historical survey of the university reform laws that took place in Italy in the last 30 years. On that occasion, we stressed how important is merit evaluation for academics and their institutions, especially in view of the much debated but not yet implemented ‘Gelmini’ reform with its long awaited new regulation for accessing academic positions (concorsi) and for determining individual weight in financial resource allocation among universities. Here, we present and compare several rankings used to evaluate the prestige and merit of Italian universities. We also consider alternative approaches to academic rankings that highlight peculiar aspects of the universities in Italy which cannot be reasonably accounted for by other international rankings. Finally, we propose a new approach that combines both national and international standing of Italian universities. It is hoped that this study will provide practical guidance to policy makers for establishing the criteria upon which merit should be assessed.

Keywords: Correlation, h-Index, Higher Education, Italy, Principal Component Analysis, Ranking, Reform Law

? Egghe, L. (2011), The impact factor rank-order distribution revisited. *Scientometrics*, **87** (3), 683-685.

Full Text: [2011\Scientometrics87, 683.pdf](2011/Scientometrics87,%20683.pdf)

Keywords: Iceberg Hypothesis

? Krampen, G., von Eye, A. and Schui, G. (2011), Forecasting trends of development of psychology from a bibliometric perspective. *Scientometrics*, **87** (3), 687-694.

Full Text: [2011\Scientometrics87, 687.pdf](2011/Scientometrics87,%20687.pdf)

Abstract: Bibliometric data on psychology publications from 1977 through 2008 are modeled and forecasted for the 10 years following 2008. Data refer to the raw frequencies of the PsycINFO (94% English-language, mainly Anglo-American publications) and the English-language documents of PSYNDEX (publications from the German-speaking countries). The series were modelled by way of exponential smoothing. In contrast to Single Moving Average methods which do not weigh observations, exponential smoothing assigns differential weights to observations. Weights reflect the distance from the most recent data point. Results suggest strongly expanding publication activities which can be represented by exponential functions. In addition, forecasted publication activities, estimated based on psychology publication frequencies in the past, show positive bibliometric trends in the Anglo-American research community. These trends go in parallel the bibliometric trends for the English-language publications of German-speaking authors. However, while positive trends were forecasted for all psychological subdisciplines of the Anglo-American publication database PsycINFO, negative bibliometric trends were estimated for English-language publications from German-speaking authors in 6 out of 20 subdisciplines.

Keywords: Bibliometry, Field, Forecasted Developmental Trends, History of Psychology, Psychology, Scientometry

? Wang, M.Y., Yu, G. and Yu, D.R. (2011), Mining typical features for highly cited papers. *Scientometrics*, **87** (3), 695-706.

Full Text: [2011\Scientometrics87, 695.pdf](2011/Scientometrics87,%20695.pdf)

Abstract: In this paper, we discuss the application of the data mining tools to identify typical features for highly cited papers (HCPs). By integrating papers’ external features and quality features, the feature space used to model HCPs was established. Then, a series of predictor teams were extracted from the feature space with rough set reduction framework. Each predictor team was used to construct a base classifier. Then the five base classifiers with the highest classification performance and larger diversity on whole were selected to construct a multi-classifier system (MCS) for HCPs. The combination prediction model obtained better performance than models of a single predictor team. 11 typical prediction features for HCPs were extracted on the basis of the MCS. The findings show that both the papers’ inner quality and external features, mainly represented as the reputation of the authors and journals, contribute to generation of HCPs in future.

Keywords: Behavior, Citation Counts, Citation Network, Data Mining, Highly Cited Papers, Network, References, Science

? Tang, L. and Shapira, P. (2011), China-US scientific collaboration in nanotechnology: Patterns and dynamics. *Scientometrics*, **88** (1), 1-16.

Full Text: [2011\Scientometrics88, 1.pdf](2011/Scientometrics88,%201.pdf)

Abstract: This paper examines the rapid growth of China in the field of nanotechnology and the rise of collaboration between China and the US in this emerging domain. Chinese scientific papers in nanotechnology are analyzed to indicate overall trends, leading fields and the most prolific institutions. Patterns of China-US nanotechnology paper co-authorship are examined over the period 1990-2009, with an analysis of how these patterns have changed over time. The paper combines bibliometric analysis and science mapping. We find rapid development in the number of China-US co-authored nanotechnology papers as well as structural changes in array of collaborative nanotechnology sub-fields. Implications for both China and the US of this evolving relationship are discussed.

Keywords: Bibliometric, Bibliometric Analysis, China, China-Us Scientific Collaboration, Co-Authorship, Coauthorship, Collaboration, Cooperation, Development, Growth, International Collaboration, Nanoscience, Nanotechnology, Papers, Publications, Science Mapping, Science-and-Technology, Self-Organization, Trends, US

? Liesch, P.W., Hakanson, L., McGaughey, S.L., Middleton, S. and Cretchley, J. (2011), The evolution of the international business field: A scientometric investigation of articles published in its premier journal. *Scientometrics*, **88** (1), 17-42.

Full Text: [2011\Scientometrics88, 17.pdf](2011/Scientometrics88,%2017.pdf)

Abstract: Macro-environmental trends such as technological changes, declining trade and investment barriers, and globalizing forces impacting both markets and production worldwide point to the heightened importance of international business (IB) and the relevance of IB research today. Despite this, a leading scholar has expressed concerns that the IB research agenda could be ‘running out of steam’ (Buckley, Journal of International Business Studies 33(2):365-373, 2002), prompting on-going introspection within the IB field. We contribute to this debate by investigating the evolution of the IB field through a scientometric examination of articles published in its premier journal, the Journal of International Business Studies (JIBS) from 1970 until 2008. We introduce a new analytical tool, Leximancer, to the fields of international business and scientometry. We show an evolution from an initial and extended emphasis on macro-environmental issues to a more recent focus on micro-economic, firm-level ones with the multinational enterprise (MNE) as an organizational form enduring throughout the entire period. We observe a field that has established a justifiable claim for relevance, participating actively in the interdisciplinary exchange of ideas.

Keywords: Concepts, Evolution, Future, Impact, International Business, Jibs, Journal, Korea, Leximancer, Network, Relevance, Research, Research Agenda, Scholarly Field, State, Strategies

? Shibayama, S. (2011), Distribution of academic research funds: A case of Japanese national research grant. *Scientometrics*, **88** (1), 43-60.

Full Text: [2011\Scientometrics88, 43.pdf](2011/Scientometrics88,%2043.pdf)

Abstract: Drawing on a database of the competitive research funds in the Japanese academia, this study examines the distribution of research grants at the university and individual levels. The data indicates high inequality at the university level and slightly lower inequality at the individual level. Over the last three decades, the total grant budget has greatly increased and an increasing number of researchers have received the funds. Simultaneously, large-size grants have become more common and multiple awarding (i.e., one researcher receives more than one grant simultaneously) has become more frequent. These changes taken together, the level of inequality has not been changed substantially. The extent of inequality largely differs between scientific fields, especially high in basic natural sciences and relatively low in social sciences. A close examination of inequality over researchers’ career indicates different patterns of transition between fields and cohorts. Finally, both at the university and individual levels, the funding distribution is found more unequal than the distribution of publications as an output indicator.

Keywords: Academia, Funding, Inequality, NIH, Publications, Research, Research Grant, Science, Social Sciences, University

? Ko, Y.M., Cho, S.R. and Park, Y.S. (2011), A study on the optimization of KCI-based index (Kor-Factor) in evaluating Korean journals. *Scientometrics*, **88** (1), 61-71.

Full Text: [2011\Scientometrics88, 61.pdf](2011/Scientometrics88,%2061.pdf)

Abstract: This study describes the development process of Kor-Factor, which is a novel composite evaluation index that was developed to promote Korean domestic academic journals. As more data accumulate, the Kor-Factor’s optimization process was modified in an attempt to address possible drawbacks of the original form, the result is presented in this study. This study compares Kor-Factor with the Impact Factor, which is the most well-known single element evaluation index. We found that Kor-Factor demonstrates a better power of differentiation and a greater capacity to reflect the reputability of key journals. The modified Kor-Factor, which has been developed through an optimization process, reveals a greater power of differentiation than the original Kor-Factor, however, the modified version has less capacity to reflect reputability. The evaluation elements of the modified Kor-Factor are better and are more evenly reflected on the index value than those of the original version. Finally, we propose the establishment of an appropriate data measurement period for the actual application of the index.

Keywords: Citations, Composite Index, Development, Evaluation, Evaluation Factor, Evaluation Index, Impact, Journal Indicator, Journals, Kor-Factor, Measurement, Science

? Chen, Z.F. and Guan, J.C. (2011), Mapping of biotechnology patents of China from 1995-2008. *Scientometrics*, **88** (1), 73-89.

Full Text: [2011\Scientometrics88, 73.pdf](2011/Scientometrics88,%2073.pdf)

Abstract: The patents of China in biotechnology in the United States Patent and Trademark Office during 1995-2008 have been analyzed in this paper with the help of bibliometrics and social network analysis techniques. The analysis has been carried out from several perspectives including total patent output of industries, universities and public research institutes (PRIs) and their positions in the knowledge network, the main innovators and their interactions, the collaboration among Chinese regions and the collaborations from abroad. The results show that though with some improvements, the patent performance of Chinese organizations and regions in biotechnology still need to be improved. The connections between Chinese innovators are not very cohesive and they depend heavily on foreign knowledge, especial knowledge from U. S. multinational firms and universities. The important innovators of China in this field are mainly PRIs and universities. More and stronger firm innovators, especially large and powerful multinational companies, are strongly needed for the nation’s biotechnology industry.

Keywords: Bibliometric Analysis, Bibliometrics, China, Collaboration, Innovation, Innovation Performance, Korea, Network Forms, Organization, Patent, Research, Social Network, Social Network Analysis

? Ouimet, M., Bedard, P.O. and Gelineau, F. (2011), Are the h-index and some of its alternatives discriminatory of epistemological beliefs and methodological preferences of faculty members? The case of social scientists in Quebec. *Scientometrics*, **88** (1), 91-106.

Full Text: [2011\Scientometrics88, 91.pdf](2011/Scientometrics88,%2091.pdf)

Abstract: This exploratory study aims at answering the following research question: Are the h-index and some of its derivatives discriminatory when applied to rank social scientists with different epistemological beliefs and methodological preferences? This study reports the results of five Tobit and two negative binomial regression models taking as dependent variable the h-index and six of its derivatives, using a dataset combining bibliometric data collected with the PoP software with cross-sectional data of 321 Quebec social scientists in Anthropology, Sociology, Social Work, Political Science, Economics and Psychology. The results reveal an epistemological/methodological effect making positivists and quantitativists globally more productive than constructivists and qualitativists.

Keywords: Bibliometric, Cross-Sectional Survey, Economics, Epistemology, Google Scholar, h Index, h-Index, Individual Researchers, Mechanisms, Psychology, Publish or Perish, Quebec, Research, Research Performance, Social Sciences, Social Scientists

? Abbas, A.M. (2011), Weighted indices for evaluating the quality of research with multiple authorship. *Scientometrics*, **88** (1), 107-131.

Full Text: [2011\Scientometrics88, 107.pdf](2011/Scientometrics88,%20107.pdf)

Abstract: Devising an index to measure the quality of research is a challenging task. In this paper, we propose a set of indices to evaluate the quality of research produced by an author. Our indices utilize a policy that assigns the weights to multiple authors of a paper. We have considered two weight assignment policies: positionally weighted and equally weighted. We propose two classes of weighted indices: weighted h-indices and weighted citation h-cuts. Further, we compare our weighted h-indices with the original h-index for a selected set of authors. As opposed to h-index, our weighted h-indices take into account the weighted contributions of individual authors in multi-authored papers, and may serve as an improvement over h-index. The other class of weighted indices that we call weighted citation h-cuts take into account the number of citations that are in excess of those required to compute the index, and may serve as a supplement to h-index or its variants.

Keywords: Authors, Authorship, Citation, Citations, Credit, h Index, h-Index, Multiple Authors, Output, Papers, Policies, Policy, Publication, Quality Of Publication, Research, Weighted Index

? An, X.Y. and Wu, Q.Q. (2011), Co-word analysis of the trends in stem cells field based on subject heading weighting. *Scientometrics*, **88** (1), 133-144.

Full Text: [2011\Scientometrics88, 133.pdf](2011/Scientometrics88,%20133.pdf)

Abstract: In this paper, co-word analysis is used to analyze the evolvement in stem cell field. Articles in the stem cell journals are downloaded from PubMed for analysis. Terms selection is one of the most important steps in co-word analysis, so the useless and the general subject headings are removed firstly, and then the major subject headings and minor subject headings are weighted respectively. Then, improved information entropy is exploited to select the subject headings with the experts consulting. Hierarchical cluster analysis is used to cluster the subject headings and the strategic diagram is formed to analyze the evolutionary trends in the stem cell field.

Keywords: Co-Word Analysis, Information, Information Entropy, Journals, Pubmed, Research Front, Strategic Diagram, Subject Heading Weighting

? Costas, R. and Bordons, M. (2011), Do age and professional rank influence the order of authorship in scientific publications? Some evidence from a micro-level perspective. *Scientometrics*, **88** (1), 145-161.

Full Text: [2011\Scientometrics88, 145.pdf](2011/Scientometrics88,%20145.pdf)

Abstract: Scientific authorship has important implications in science since it reflects the contribution to research of the different individual scientists and it is considered by evaluation committees in research assessment processes. This study analyses the order of authorship in the scientific output of 1,064 permanent scientists at the Spanish CSIC (WoS, 1994-2004). The influence of age, professional rank and bibliometric profile of scientists over the position of their names in the byline of publications is explored in three different research areas: Biology and Biomedicine, Materials Science and Natural Resources. There is a strong trend for signatures of younger researchers and those in the lower professional ranks to appear in the first position (junior signing pattern), while more veteran or highly-ranked ones, who tend to play supervisory functions in research, are proportionally more likely to sign in the last position (senior signing pattern). Professional rank and age have an effect on authorship order in the three fields analysed, but there are inter-field differences. Authorship patterns are especially marked in the most collaboration-intensive field (i.e. Biology and Biomedicine), where professional rank seems to be more significant than age in determining the role of scientists in research as seen through their authorship patterns, while age has a more significant effect in the least collaboration-intensive field (Natural Resources).

Keywords: Age Analysis, Assessment, Authorship, Bibliometric, Bibliometrics, Biomedicine, Collaboration, Csic, Evaluation, Gender, Impact, Individual Level Analysis, Micro-Level Analysis, Multiple Authorship, Order of Authorship, Patterns, Productivity, Professional, Publications, Research, Researchers, Science, Scientific Publications, Trend, Young Scientists

? Varga, A.V. (2011), Measuring the semantic integrity of scientific fields: A method and a study of sociology, economics and biophysics. *Scientometrics*, **88** (1), 163-177.

Full Text: [2011\Scientometrics88, 163.pdf](2011/Scientometrics88,%20163.pdf)

Abstract: The paper introduces a concept for measuring the interpretive fragmentation of scientific fields by the analysis of their citation networks. Transitive closure in two-mode networks is the basis of the proposed measurement. To test the validity of the concept two analyses are presented. One compares the integrity of two social sciences, sociology and economics, and a natural science, biophysics. The results are in line with the widely held opinion, that because of the lack in cumulative and consensual knowledge production mechanisms the social sciences are more disintegrated. Sociology is considerably more fragmented then economics, as the different paradigm structure of these disciplines would predict. As a second test, the fragmentation of scholarly communication inside and between the sub-fields of sociology is measured. The results correctly indicate that meaning making processes are taking place inside invisible colleges.

Keywords: Ambiguity, Citation, Citation Analysis, Citation Networks, Economics, Integration, Meaning, Measurement, Network Analysis, Paradigms, Social Sciences

? Zavadskas, E.K., Kirvaitis, R. and Dagiene, E. (2011), Scientific publications released in the Baltic States. *Scientometrics*, **88** (1), 179-190.

Full Text: [2011\Scientometrics88, 179.pdf](2011/Scientometrics88,%20179.pdf)

Abstract: The article focuses on evolution of scientific publications released in the Baltic States (Lithuania, Latvia and Estonia) and refers to international databases that contain scientific papers produced over the last 20 years of independence. The countries share the same history of restoration of independence after 40 years of occupation. The article shall specifically focus on the period of post EU accession in 2004. It will discuss the contribution of Kaunas University of Technology, Vilnius Gediminas Technical University, Riga Technical University and Tallinn University of Technology to the total number of publications in these countries. The investigation was based on databases of Thomson Reuters Web of Science, Essential Science Indicators and Journal Citation Report. Additionally, it employed the Scimago ranking system based on Scopus database. Data analysis also involved similar indices that provide the number of papers and their citation results as well as the average number of citations per paper.

Keywords: Baltic States, Citation, Citation Analysis, Citations, Databases, History, Indicators, Output, Papers, Publication Analysis, Publication on Engineering, Publications, Ranking, Research Journal, Scientific Publication, Scientific Publications, Scopus, Technical Universities, University, Web of Science

? Lin, F. (2011), A study on power-law distribution of hostnames in the URL references. *Scientometrics*, **88** (1), 191-198.

Full Text: [2011\Scientometrics88, 191.pdf](2011/Scientometrics88,%20191.pdf)

Abstract: The power-law distribution and the Garfield’s Law of Concentration of journal citation have long been verified by empirical data. As a relatively new type of reference, the URL references are cited more and more frequently in the scientific papers and their distribution is proved to fit for the Garfield’s Law of Concentration too. In this article, we collect three URL references datasets extracted from papers written by researchers belonging to three big research groups : Chinese Academy of Sciences, Max Planck Institute, and the whole Chinese scientific researchers. Through the curve-fitting with SPSS and contrast the results with the judgment standard of power-law distribution, we verify that there also exists power-law distribution in the citation frequency of hostnames in these three URL references datasets. And our experimental results show that the range of power exponent in the journal references and the URL references are different. Started from the concrete empirical procedures and the final experimental results, we analyze four factors that may lead to this difference between journal references and URL references: the sample size, the sampling method, the concentration of citation and the type property of citation.

Keywords: Citation, Citation Distribution, Citations, Hostname Citation Frequency, Index, Journal, Law, Model, Papers, Power-Law Distribution, Rank Distributions, Research, Url Reference

? Bouabid, H. (2011), Revisiting citation aging: A model for citation distribution and life-cycle prediction. *Scientometrics*, **88** (1), 199-211.

Full Text: [2011\Scientometrics88, 199.pdf](2011/Scientometrics88,%20199.pdf)

Abstract: The study of citation distribution provides retrospective and prospective picture of the evolving impact of a corpus of publications on knowledge community. All distribution models agree on the rise of the number of citations in the first years following the publication to reach a peak and then tend to be less cited when time passes. However, questions such as how long it will continue being cited and what is objectively the rate of the decline remain unanswered. Built up of simple polynomial function, the proposed model is proven to be suitable to represent the observed citation distribution over time and to interestingly identify with accuracy when the major loss of citations happens. I calculate from the model the ‘residual citations’ representing the citations kept after a long time period after publication year. I demonstrate that the residual citations may be greater than or equal to zero, meaning that the ‘life-cycle’ of the corpus is infinite, contrary to what some researches termed to be around 21 years. This model fits the observed data from SCI according to R-sq which is greater than 98.9%. Rather, it is very simple and easy to implement and can be used by not highly-skilled scientometric users. Finally, the model serves as a citation predictive tool for a corpus by determining the citations that would obtain at any time of its life-cycle.

Keywords: Behavior, Citation, Citation Aging, Citation Distribution, Citation-Prediction, Citations, Impact, Isi-Data, Life-Cycle, Life-Time, Model, Observed Citations, Obsolescence, Oecd-Countries, Publication, Publication Delays, Publications, SCI, Science

? Yoon, J. and Kim, K. (2011), Identifying rapidly evolving technological trends for R&D planning using SAO-based semantic patent networks. *Scientometrics*, **88** (1), 213-228.

Full Text: [2011\Scientometrics88, 213.pdf](2011/Scientometrics88,%20213.pdf)

Abstract: Patents constitute an up-to-date source of competitive intelligence in technological development, thus, patent analysis has been a vital tool for identifying technological trends. Patent citation analysis is easy to use, but fundamentally has two main limitations: (1) new patents tend to be less cited than old ones and may miss citations to contemporary patents, (2) citation-based analysis cannot be used for patents in databases which do not require citations. Naturally, citation-based analysis tends to underestimate the importance of new patents and may not work in rapidly-evolving industries in which technology life-cycles are shortening and new inventions are increasingly patented worldwide. As a remedy, this paper proposes a patent network based on semantic patent analysis using subject-action-object (SAO) structures. SAO structures represent the explicit relationships among components used in a patent, and are considered to represent key concepts of the patent or the expertise of the inventor. Based on the internal similarities between patents, the patent network provides the up-to-date status of a given technology. Furthermore, this paper suggests new indices to identify the technological importance of patents, the characteristics of patent clusters, and the technological capabilities of competitors. The proposed method is illustrated using patents related to synthesis of carbon nanotubes. We expect that the proposed procedure and analysis will be incorporated into technology planning processes to assist experts such as researchers and R&D policy makers in rapidly-evolving industries.

Keywords: Bibliometrics, Citation, Citation Analysis, Citation Network, Citations, Databases, Development, Diffusion, Indicators, Natural Language Processing (NLP), Natural-Language, Opportunities, Patent, Patent Mining, Patent Network, Patents, Policy, Research and Development (R&D) Trend, Semantic Patent Similarity, Similarity, Small World, Subject-Action-Object (SAO) Structures

? Abramo, G., D’Angelo, C.A. and Di Costa, F. (2011), National research assessment exercises: The effects of changing the rules of the game during the game. *Scientometrics*, **88** (1), 229-238.

Full Text: [2011\Scientometrics88, 229.pdf](2011/Scientometrics88,%20229.pdf)

Abstract: National research evaluation exercises provide a comparative measure of research performance of the nation’s institutions, and as such represent a tool for stimulating research productivity, particularly if the results are used to inform selective funding by government. While a school of thought welcomes frequent changes in evaluation criteria in order to prevent the subjects evaluated from adopting opportunistic behaviors, it is evident that the “rules of the game” should above all be functional towards policy objectives, and therefore be known with adequate forewarning prior to the evaluation period. Otherwise, the risk is that policy-makers will find themselves faced by a dilemma: should they reward universities that responded best to the criteria in effect at the outset of the observation period or those that result as best according to rules that emerged during or after the observation period? This study verifies if and to what extent some universities are penalized instead of rewarded for good behavior, in pursuit of the objectives of the “known” rules of the game, by comparing the research performances of Italian universities for the period of the nation’s next evaluation exercise (2004-2008): first as measured according to criteria available at the outset of the period and next according to those announced at the end of the period.

Keywords: Assessment, Bibliometric Indicators, Bibliometrics, Evaluation, Evaluation Criteria, Italy, Performance-Based Research Funding, Policy, Research, Research Assessment Exercises, Research Evaluation, Research Performance, Universities, University

? Breschi, S. and Malerba, F. (2011), Assessing the scientific and technological output of EU Framework Programmes: Evidence from the FP6 projects in the ICT field. *Scientometrics*, **88** (1), 239-257.

Full Text: [2011\Scientometrics88, 239.pdf](2011/Scientometrics88,%20239.pdf)

Abstract: This paper provides a quantitative assessment of the scientific and technological productivity of FP6 projects by exploiting a new database on articles and patents resulting from EU funded projects. Starting from the FP6, the design of the European technology policy has undergone significant changes with the introduction of new funding instruments aimed at achieving a “critical mass” of resources. Our empirical results provide support to the concerns, expressed by several observers, regarding the fact that the new funding instruments may have resulted in artificially “too large” research consortia. The available empirical evidence shows that scientific productivity increases with the number of participants following a U-inverted shape, thereby indicating the existence of decreasing marginal returns to an increase in the size of research consortia. A second key result of the paper is related to the existence of significant differences of performance among funding instruments. In particular, after accounting for the larger amount of resources allocated to them, Integrated Projects perform less well in terms of scientific output than both STRePs and Networks of Excellence and they do not exhibit a superior performance than STRePs in terms of patent applications.

Keywords: Assessment, Bibliometric Analysis, Framework Programme, Patent, Policy, Research, Research Consortia, Scientific And Technological Performance

? Choi, D.G., Lee, H. and Sung, T.K. (2011), Research profiling for ‘standardization and innovation’. *Scientometrics*, **88** (1), 259-278.

Full Text: [2011\Scientometrics88, 259.pdf](2011/Scientometrics88,%20259.pdf)

Abstract: This paper addresses the profiling of research papers on ‘standardization and innovation’-exploring major topics and arguments in this field. Drawing on 528 papers retrieved from the database, Web of Science, we employed trend, factor, and clustering analyses to demonstrate that the standardization and innovation research has continuously grown from publication of 13 papers in 1995 to 68 papers in 2008, the majority of these papers have been published in the six subject group domains of management, economics, environment, chemistry, computer science, and telecommunications. Technology innovation management specialty journals are the most central sources favorable for these themes. We also present an exploratory taxonomy that offers nine topical clusters to demonstrate the contextual structures of standardization and innovation. The implications of our results for ongoing consistent policy and future research into standardization and innovation are discussed.

Keywords: Bibliometrics, Clustering Analysis, Dominant Designs, Economics, Empirical-Analysis, Environment, Industry Standards, Information-Systems, Innovation, Intellectual Property-Rights, Journals, Papers, Performance, Policy, Publication, Publication Analysis, Quality Standards, Research, Research Papers, Research Profiling, Science-and-Technology, Setting Organizations, Standardization, Taxonomy, Technical Innovations, Trend, Web of Science

? Franceschini, F. and Maisano, D. (2011), Proposals for evaluating the regularity of a scientist’s research output. *Scientometrics*, **88** (1), 279-295.

Full Text: [2011\Scientometrics88, 279.pdf](2011/Scientometrics88,%20279.pdf)

Abstract: Evaluating the career of individual scientists according to their scientific output is a common bibliometric problem. Two aspects are classically taken into account: overall productivity and overall diffusion/impact, which can be measured by a plethora of indicators that consider publications and/or citations separately or synthesise these two quantities into a single number (e.g. h-index). A secondary aspect, which is sometimes mentioned in the rules of competitive examinations for research position/promotion, is time regularity of one researcher’s scientific output. Despite the fact that it is sometimes invoked, a clear definition of regularity is still lacking. We define it as the ability of generating an active and stable research output over time, in terms of both publications/quantity and citations/diffusion. The goal of this paper is introducing three analysis tools to perform qualitative/quantitative evaluations on the regularity of one scientist’s output in a simple and organic way. These tools are respectively (1) the PY/CY diagram, (2) the publication/citation Ferrers diagram and (3) a simplified procedure for comparing the research output of several scientists according to their publication and citation temporal distributions (Borda’s ranking). Description of these tools is supported by several examples.

Keywords: Bibliometric, Borda’s Method, Citation, Citation Regularity, Citation, Publication Distribution, Citations, Ferrers Diagram, h Index, h-Index, h-Index, Individual Scientist, Journals, Publication, Publication Regularity, Publications, Ranking, Research, Research Evaluation, Research Output

? Glänzel, W. and Thijs, B. (2011), Using ‘core documents’ for the representation of clusters and topics. *Scientometrics*, **88** (1), 297-309.

Full Text: [2011\Scientometrics88, 297.pdf](2011/Scientometrics88,%20297.pdf)

Abstract: The notion of ‘core documents’, first introduced in the context of co-citation analysis and later re-introduced for bibliographic coupling, refers to the representation of the core of a publication set according to given criteria. In the present study, the notion of core documents is extended to the combination of citation-based and textual links. It is shown that core documents defined this way can be used to represent and describe document clusters and topics at different levels of aggregation. Methodology is illustrated using the example of two ISI Subject Categories selected from applied and social sciences.

Keywords: Bibliographic, Bibliographic Coupling, Cluster Analysis, Combined Cocitation, Core Documents, Hybrid Clustering, Methodology, Publication, Science, Social Sciences, Text Mining, Word Analysis

? Leite, P., Mugnaini, R. and Leta, J. (2011), A new indicator for international visibility: exploring Brazilian scientific community. *Scientometrics*, **88** (1), 311-319.

Full Text: [2011\Scientometrics88, 311.pdf](2011/Scientometrics88,%20311.pdf)

Abstract: Brazilian science has increased fast during the last decades. An example is the increasing in the country’s share in the world’s scientific publication within the main international databases. But what is the actual weight of international publications to the whole Brazilian productivity? In order to respond this question, we have elaborated a new indicator, the International Publication Ratio (IPR). The data source was Lattes Database, a database organized by one of the main Brazilian S&T funding agency, which encompasses publication data from 1997 to 2004 of about 51,000 Brazilian researchers. Influences of distinct parameters, such as sectors, fields, career age and gender, are analyzed. We hope the data presented may help S&T managers and other S&T interests to better understand the complexity under the concept scientific productivity, especially in peripheral countries in science, such as Brazil.

Keywords: Age, Brazil, Brazilian Science, Databases, Impact, Index, International Publication Ratio, Productivity, Profile, Publication, Publications, Researchers, Science, Scientific Publication, Scientific Publications, Technology, Visibility, Women

? Ravallion, M. and Wagstaff, A. (2011), On measuring scholarly influence by citations. *Scientometrics*, **88** (1), 321-337.

Full Text: [2011\Scientometrics88, 321.pdf](2011/Scientometrics88,%20321.pdf)

Abstract: Bibliometric measures based on citations are widely used in assessing the scientific publication records of authors, institutions and journals. Yet currently favored measures lack a clear theoretical foundation and are known to have counter-intuitive properties. The paper proposes a new approach that is grounded on a theoretical “influence function,” representing explicit prior beliefs about how citations reflect influence. Conditions are derived for robust qualitative comparisons of influence-conditions that can be implemented using readily-available data. Two examples are provided, one using the world’s top-10 economics department, the other using the top-10 economics journals.

Keywords: Authors, Bibliometric, Citations, Economics, Economics Departments, Economics Journals, G-Index, h-Index, Inequality, Journals, Publication, Ranking, Scientific Influence, Scientific Publication

? Bensman, S.J. (2011), The publish or perish book: Your guide to effective and responsible citation analysis. *Scientometrics*, **88** (1), 339-342

Full Text: [2011\Scientometrics88, 339.pdf](2011/Scientometrics88,%20339.pdf)

Keywords: Citation, Citation Analysis, Google Scholar, Impact, Journals, Scopus

? Gao, X., Guan, J.C. and Rousseau, R. (2011), Mapping collaborative knowledge production in China using patent co-inventorships. *Scientometrics*, **88** (2), 343-362.

Full Text: [2011\Scientometrics88, 343.pdf](2011/Scientometrics88,%20343.pdf)

Abstract: Only a few cases of systematic empirical research have been reported investigating collaborative knowledge production in China and its implications for China’s national and regional innovation system. Using Chinese patent data in the US Patent and Trademark Office (USPTO), this paper examines the geographic variations in intraregional, inter-regional and international knowledge exchanges of China from 1985 to 2007. Degree centrality reveals that intraregional and international collaborations are the main channels of knowledge exchange for the provinces and municipalities of China while inter-regional knowledge exchange is relatively weak. Besides, over the two decades, the knowledge exchange network has been expanding (connecting an increasing number of provinces and countries), becoming more decentralized (increasing number of hubs) and more cohesive (more linkages). A blockmodel analysis further reveals that the inter-regional network of China begins to show characteristics of a core-periphery structure. The most active knowledge exchange occurs between members of the core block composed by the most advanced provinces while the members of the peripheral block from less favored regions have few or no local and extra-local knowledge exchange. Building a strong knowledge transfer network would much improve the innovation capacities in less favored regions and help them break out from their “locked-in” development trajectories.

Keywords: Authorship, China, Development, Diffusion, Exploration, Geographical Proximity, Innovation, Innovation System, Knowledge Exchange, Knowledge Transfer, Networks, Patent, Regions, Research, Scientific Collaboration, Spillovers, Universities, US

? Egghe, L. (2011), The influence of random removal of sources and items on the h-index. *Scientometrics*, **88** (2), 363-370.

Full Text: [2011\Scientometrics88, 363.pdf](2011/Scientometrics88,%20363.pdf)

Abstract: If we have two information production processes with the same h-index, random removal of items causes one system to have a higher h-index than the other system while random removal of sources causes the opposite effect. In a Lotkaian framework we prove formulae for the h-index in case of random removal of items and in case of random removal of sources. In conclusion, we warn for the use of the h-index in case of incomplete data sets.

Keywords: h Index, h-Index, Hirsch-Index, Hirsch-Index, Information, Items, Random Removal, Sources, Transformations

? Andersen, J.P. and Hammarfelt, B. (2011), Price revisited: On the growth of dissertations in eight research fields. *Scientometrics*, **88** (2), 371-383.

Full Text: [2011\Scientometrics88, 371.pdf](2011/Scientometrics88,%20371.pdf)

Abstract: This paper studies the production of dissertations in eight research fields in the natural sciences, the social sciences and the humanities. In using doctoral dissertations it builds on De Solla Prices seminal study which used PhD dissertations as one of several indicators of scientific growth (Price, Little science, big science, 1963). Data from the ProQuest: Dissertations and Theses database covering the years 1950-2007 are used to depict historical trends, and the Gompertz function was used for analysing the data. A decline in the growth of dissertations can be seen in all fields in the mid-eighties and several fields show only a modest growth during the entire period. The growth profiles of specific disciplines could not be explained by traditional dichotomies such as pure/applied or soft/hard, but rather it seems that the age of the discipline appears to be an important factor. Thus, it is obvious that the growth of dissertations must be explained using several factors emerging both inside and outside academia. Consequently, we propose that the output of dissertations can be used as an indicator of growth, especially in fields like the humanities, where journal or article counts are less applicable.

Keywords: Dissertations, Growth of Science, History of Science, Journal, Models, Publication Analysis, Research, Social Sciences

? Albarran, P., Crespo, J.A., Ortuno, I. and Ruiz-Castillo, J. (2011), The skewness of science in 219 sub-fields and a number of aggregates. *Scientometrics*, **88** (2), 385-397.

Full Text: [2011\Scientometrics88, 385.pdf](2011/Scientometrics88,%20385.pdf)

Abstract: This paper studies evidence from Thomson Scientific (TS) about the citation process of 3.7 million articles published in the period 1998-2002 in 219 Web of Science (WoS) categories, or sub-fields. Reference and citation distributions have very different characteristics across sub-fields. However, when analyzed with the Characteristic Scores and Scales (CSS) technique, which is replication and scale invariant, the shape of these distributions over three broad categories of articles appears strikingly similar. Reference distributions are mildly skewed, but citation distributions with a 5-year citation window are highly skewed: the mean is 20 points above the median, while 9-10% of all articles in the upper tail account for about 44% of all citations. The aggregation of sub-fields into disciplines and fields according to several aggregation schemes preserve this feature of citation distributions. It should be noted that when we look into subsets of articles within the lower and upper tails of citation distributions the universality partially breaks down. On the other hand, for 140 of the 219 sub-fields the existence of a power law cannot be rejected. However, contrary to what is generally believed, at the sub-field level the scaling parameter is above 3.5 most of the time, and power laws are relatively small: on average, they represent 2% of all articles and account for 13.5% of all citations. The results of the aggregation into disciplines and fields reveal that power law algebra is a subtle phenomenon.

Keywords: Characteristic Scores, Citation, Citation Analysis, Citations, Distributions, Indicators, Networks, Power Laws, Research Performance, Scales, Scientific Performance, Scores, Statistics, Web of Science

? Lv, P.H., Wang, G.F., Wan, Y., Liu, J., Liu, Q. and Ma, F.C. (2011), Bibliometric trend analysis on global graphene research. *Scientometrics*, **88** (2), 399-419.

Full Text: [2011\Scientometrics88, 399.pdf](2011/Scientometrics88,%20399.pdf)

Abstract: Graphene is a rising star as one of the promising materials with many applications. Its global literature increased fast in recent years. In this work, bibliometric analysis and knowledge visualization technology were applied to evaluate global scientific production and developing trend of graphene research. The data were collected from 1991 to 2010 from the Science Citation Index database, Conference Proceeding Citation Index database and Derwent Innovation Index database integrated by Thomson Reuters. The published papers from different subjects, journals, authors, countries and keywords distributed in several aspects of research topics proved that graphene research increased rapidly over past 20 years and boosted in recent 5 years. The distinctions in knowledge map show that the clusters distributed regularly in keywords of applied patents in recent 5 years due to the potential applications of graphene research gradually found. The analytical results provided several key findings of bibliometrics trend.

Keywords: Authors, Bibliometric, Bibliometric Analysis, Bibliometrics, Carbon-Films, Citation, Co-Authorship, Co-Words, Conference, Epitaxial Graphene, Graphene, Innovation, Journals, Knowledge Mapping, Literature, Papers, Research, Research Trend, Science, Science Citation Index, Trend

? Campanario, J.M. and Coslado, M.A. (2011), Benford’s law and citations, articles and impact factors of scientific journals. *Scientometrics*, **88** (2), 421-432.

Full Text: [2011\Scientometrics88, 421.pdf](2011/Scientometrics88,%20421.pdf)

Abstract: First order digits in data sets of natural and social data often follow a distribution called Benford’s law. We studied the number of articles published, citations received and impact factors of all journals indexed in the Science Citation Index from 1998 to 2007. We tested their compliance with Benford’s law. Citations data followed Benford’s law remarkably well in all years studied. However, for the data on the numbers of articles, the differences between the values predicted by Benford’s law and the observed values were always statistically significant. This was also the case for most data for impact factors.

Keywords: Articles, Benford Law, Citation, Citations, Compliance, Impact, Impact Factor, Journals, Science Citation Index

? Chen, Y.S. (2011), Using patent analysis to explore corporate growth. *Scientometrics*, **88** (2), 433-448.

Full Text: [2011\Scientometrics88, 433.pdf](2011/Scientometrics88,%20433.pdf)

Abstract: This study applies patent analysis to discuss the influences of the three aspects of patent trait-a firm’s revealed technology advantage in its most important technological field (RTA(MIT)), relative patent position in its most important technological field (RPPMIT), and patent share in its most important technological field (PSMIT)-upon corporate growth and discusses the moderation effect of relative growth rate of its most important technological field (RGR(MIT)) in the American pharmaceutical industry. The results demonstrate that the three relationships between corporate growth and the three aspects of patent trait are positive, and verify that RGR(MIT) moderates the three relationships. This study suggests that pharmaceutical companies should enhance their R&D capabilities, the degree of leading position, and concentration of R&D investment in their most important technological fields to increase their growth. Finally, this study classifies the pharmaceutical companies into four types, and provides some suggestions to them.

Keywords: Citations, Companies, Competences, Corporate Growth, Development Performance, Firm, Market Value, Patent, Patent Analysis, Patent Share (PS), Pharmaceutical Companies, Pharmaceutical-Industry, Portfolios, Productivity, Relative Patent Position (RPP), Research-And-Development, Revealed Technology Advantage (RTA)

? Barnett, G.A., Huh, C., Kim, Y. and Park, H.W. (2011), Citations among communication journals and other disciplines: A network analysis. *Scientometrics*, **88** (2), 449-469.

Full Text: [2011\Scientometrics88, 449.pdf](2011/Scientometrics88,%20449.pdf)

Abstract: This article describes the results of a network analysis based on the citation among Communication journals and those academic disciplines that are cited by those journals labeled as “Communication” by the Web of Science. The results indicate that the journals indexed solely as Communication rather than those also tagged as another social science are more central in the citation network. Further, a cluster analysis of the cited disciplines revealed three groupings, a micro psychological cluster, a macro socio-political group and a woman’s studies clique. A two-mode network analysis found that the most central Communication journals cited multiple clusters, while the peripheral journals cited only one, suggesting that the structure of influence on the field of Communication is more complex than suggested by Park and Leydesdorff (Scientometrics 81(1):157-175, 2009). Also, the results indicate that the macro cluster is about twice as influential as the micro cluster, rather than as Park and Leydesdorff suggest that Psychology is the discipline’s primary influence.

Keywords: Association, Centrality, Citation, Citation Analysis, Citations, Communication, Field, Journals, Network Analysis, Patterns, Primary, Psychology, Science, Scientometrics, Web of Science

? Toivanen, H. and Ponomariov, B. (2011), African regional innovation systems: Bibliometric analysis of research collaboration patterns 2005-2009. *Scientometrics*, **88** (2), 471-493.

Full Text: [2011\Scientometrics88, 471.pdf](2011/Scientometrics88,%20471.pdf)

Abstract: Understanding the nature and dynamics of Africa’s collaborative research networks is critical for building and integrating the African innovation system. This paper investigates the collaborative structure of the African research systems, with focus on regions and integration. Drawing on a bibliometric analysis of co-authorship of African research publications in 2005-2009, we propose an empirically derived grouping of African research community into three distinct research regions: Southern-Eastern, Western, and Northern. The three regions are established and defined in terms of active co-authorship clusters within Africa, as well as through co-authorship links with non-African countries and regions. We examine co-authorship links both at the national and city levels in order to provide a robust and nuanced empirical basis for the three African research regions. The collaboration patterns uncovered cast light on the emerging innovation systems in Africa by pointing out the differing national, regional, and global roles of countries and cities within collaborative research networks. Lack of research capabilities is the primary factor arresting the development of African innovation systems, but our analysis also suggests that Africa’s internal research collaboration suffers from structural weaknesses and uneven integration. We also identify that South Africa, and some emerging new research hubs, hold critical networking function for linking African researchers.

Keywords: Africa, Bibliometric, Bibliometric Analysis, Co-Authorship, Coauthorship, Collaboration, Development, Innovation, Innovation Systems, Primary, Publications, Research, Science

? van Raan, A.F.J., van Leeuwen, T.N. and Visser, M.S. (2011), Severe language effect in university rankings: Particularly Germany and France are wronged in citation-based rankings. *Scientometrics*, **88** (2), 495-498.

Full Text: [2011\Scientometrics88, 495.pdf](2011/Scientometrics88,%20495.pdf)

Abstract: We applied a set of standard bibliometric indicators to monitor the scientific state-of-arte of 500 universities worldwide and constructed a ranking on the basis of these indicators (Leiden Ranking 2010). We find a dramatic and hitherto largely underestimated language effect in the bibliometric, citation-based measurements of research performance when comparing the ranking based on all Web of Science (WoS) covered publications and on only English WoS covered publications, particularly for Germany and France.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Language of Publication, Publications, Ranking, Research, Research Performance, Science, University, University Rankings, Web of Science

? Leydesdorff, L. (2011), “Structuration” by intellectual organization: the configuration of knowledge in relations among structural components in networks of science. *Scientometrics*, **88** (2), 499-520.

Full Text: [2011\Scientometrics88, 499.pdf](2011/Scientometrics88,%20499.pdf)

Abstract: Using aggregated journal-journal citation networks, the measurement of the knowledge base in empirical systems is factor-analyzed in two cases of interdisciplinary developments during the period 1995-2005: (i) the development of nanotechnology in the natural sciences and (ii) the development of communication studies as an interdiscipline between social psychology and political science. The results are compared with a case of stable development: the citation networks of core journals in chemistry. These citation networks are intellectually organized by networks of expectations in the knowledge base at the specialty (that is, above-journal) level. The “structuration” of structural components (over time) can be measured as configurational information. The latter is compared with the Shannon-type information generated in the interactions among structural components: the difference between these two measures provides us with a measure for the redundancy generated by the specification of a model in the knowledge base of the system. This knowledge base incurs (against the entropy law) to variable extents on the knowledge infrastructures provided by the observable networks of relations.

Keywords: Anticipatory Systems, Citation, Citation Networks, Communication, Configuration, Development, Dynamics, Dynamics, Industry, Information, Interaction Information, Japan, Journal, Journals, Knowledge, Meaning, Measurement, Model, Redundancy, Self-Organization, Synergy

? Sakr, S. and Alomari, M. (2011), A decade of database research publications: A look inside. *Scientometrics*, **88** (2), 521-533.

Full Text: [2011\Scientometrics88, 521.pdf](2011/Scientometrics88,%20521.pdf)

Abstract: The database management technology has played a vital role in the advancements of the information technology field. Database researchers are one of the key players and main sources to the growth of the database systems. They are playing a foundational role in creating the technological infrastructure from which database advancements evolve. We analyze the database research publications of nine top-tier and prestigious database research venues. In particular, we study the publications of four major core database technology conferences (SIGMOD, VLDB, ICDE, EDBT), two main theoretical database conferences (PODS, ICDT) and three database journals (TODS, VLDB Journal, TKDE) over a period of 10 years (2001-2010). Our analysis considers only regular papers as we do not include short papers, demo papers, posters, tutorials or panels into our statistics. In this study, we report the list of the authors with the highest number of publications for each conference/journal separately and in combined. We analyze the preference of the database research community towards publishing their work in prestigious conferences or major database journals. We report about the most successful co-authorship relationships in the database research community in the last decade. Finally, we analyze the growth in the number of research publications and the size of the research community in the last decade.

Keywords: Authors, Citation Analysis, Co-Authorship, Coauthorship, Database Research Venues, h-Index, Information, Journal, Journals, Output, Papers, Publications, Publishing, Research, Science, Statistics, Top Publishers

? Hennemann, S., Wang, T. and Liefner, I. (2011), Measuring regional science networks in China: A comparison of international and domestic bibliographic data sources. *Scientometrics*, **88** (2), 535-554.

Full Text: [2011\Scientometrics88, 535.pdf](2011/Scientometrics88,%20535.pdf)

Abstract: Bibliographic databases are frequently used and analysed for the purpose of assessing the capacity and performance of individual researchers or entire research systems. Many of the advantages and disadvantages are the subject of continued discussion in the relevant literature, although only rarely with respect to the regional dimension of scientific publication activity. The importance of the regional dimension of science is reflected in many theoretical concepts, ranging from innovation system theories to territorial cluster concepts and learning regions. This article makes use of the extensive information found in bibliographic data and assesses the reliability of this information as a proxy indicator for the spatial dimension of scientific collaboration in emerging economies. This is undertaken using the example of the emerging field of biotechnology in China from 2000 onwards. Two data sets have been prepared: (1) the frequently used ISI Web of Knowledge database (SCI-Expanded) and (2) the domestic Chinese Chongqing VIP database. Both data sources were analysed using a variety of bibliometric and network scientific methods. The structural and topological similarity of networks, built from co-authorship data, is apparent between the two databases. At an abstract level, general network forces are present, resulting in similar network sizes, clustering, or assortativity. However, introducing additional complexity through regional subdivision reveals many differences between the two data sources that must be accounted for in the analytic design of future scientometric research in dynamic spaces.

Keywords: Bibliographic, Bibliometric, Biotechnology, China, Citation-Index, Co-Authorship, Coauthorship, Collaboration, Database Comparison, Databases, Emergence, Information, Innovation, Journals, Knowledge, Learning, Literature, Nanoscience, Publication, Publications, Regional Science Networks, Research, Research Collaboration, Research Performance, Scientific Publication, Spatial Scientometrics, Technical-Papers, Technology

? Prathap, G. (2011), Quasity, when quantity has a quality all of its own-toward a theory of performance. *Scientometrics*, **88** (2), 555-562.

Full Text: [2011\Scientometrics88, 555.pdf](2011/Scientometrics88,%20555.pdf)

Abstract: Quality, Quantity, Performance,aEuro broken vertical bar An unresolved challenge in performance evaluation in a very general context that goes beyond scientometrics, has been to determine a single indicator that can combine quality and quantity of output or outcome. Toward this end, we start from metaphysical considerations and propose introducing a new name called Quasity to describe those quantity terms which incorporate a degree of quality and best measures the output. The product of quality and quasity then becomes an energy term which serves as a performance indicator. Lessons from kinetics, bibliometrics and sportometrics are used to build up this theme.

Keywords: Bibliometrics, Energy-Index, Evaluation, Index, Kinetics, P-Index, Performance, Quality, Quantity, Quasity, Scientometrics, X = Lo = L(2)I

? Lopez-Illescas, C., de Moya-Anegon, F. and Moed, H.F. (2011), A ranking of universities should account for differences in their disciplinary specialization. *Scientometrics*, **88** (2), 563-574.

Full Text: [2011\Scientometrics88, 563.pdf](2011/Scientometrics88,%20563.pdf)

Abstract: A bibliometric analysis of the 50 most frequently publishing Spanish universities shows large differences in the publication activity and citation impact among research disciplines within an institution. Gini Index is a useful measure of an institution’s disciplinary specialization and can roughly categorize universities in terms of general versus specialized. A study of the Spanish academic system reveals that assessment of a university’s research performance must take into account the disciplinary breadth of its publication activity and citation impact. It proposes the use of graphs showing not only a university’s article production and citation impact, but also its disciplinary specialization. Such graphs constitute both a warning and a remedy against one-dimensional approaches to the assessment of institutional research performance.

Keywords: Academic Systems, Assessment, Bibliometric, Bibliometric Analysis, Bibliometrics, Citation, Citation Impact, Disciplinary Specialization, Graphs, Impact, Institutional Research Performance, Publication, Publishing, Ranking, Research, Research Performance, Spanish Academic System, University Rankings

? Kumar, R., Tripathi, R.C. and Tiwari, M.D. (2011), A case study of impact of patenting in the current developing economies in Asia. *Scientometrics*, **88** (2), 575-587.

Full Text: [2011\Scientometrics88, 575.pdf](2011/Scientometrics88,%20575.pdf)

Abstract: In the current scenario of the global economy and race for the next Asian super power, overall economic strength of the two countries, India and China, is a most debated topic. The future role of intellectual property protection especially in the form of patent system and the growth of industrialization for these two developing economies in ASIA may prove to be crucial over all other assets. In the current development scene of the changing global market supported by intangible asset of inventions protected mainly through the patents is emerging to play an important role. This paper elaborates the statistical research on patents granted/filed in the US Patent and Trade Mark office (US-PTO), PCT of WIPO and in the home countries over last 35 years of aforesaid two Asian countries. It is found that the economic and technological growth of both of the countries may make main difference primarily based on the level of patenting activity by them.

Keywords: Asia, China, Development, Economic Growth, Global Trading, Impact, Industrial Development, Innovations, Intellectual Property-Rights, Patent, Patents And IPR’S, Research, Statistical, US

? Kissin, I. and Bradley, E.L. (2011), Top Journals Selectivity Index: Is it acceptable for drugs beyond the field of analgesia? *Scientometrics*, **88** (2), 589-597.

Full Text: [2011\Scientometrics88, 589.pdf](2011/Scientometrics88,%20589.pdf)

Abstract: To predict the success of an analgesic drug we have suggested a bibliometric indicator, the Top Journals Selectivity Index (TJSI) (Kissin, Scientometrics, 86:785-795, 2011). It represents the ratio (as %) between the number of all types of articles on a particular drug in the top 20 biomedical journals and the number of articles on that drug in all (> 5,000) journals covered by Medline over the first 5 years after a drug’s introduction. For example, the highest TJSI score among analgesics was that of sumatriptan, the most successful drug for the treatment of migraine. The aim of this study was to demonstrate that TJSI may be used not only in the field of analgesics, but also for various other categories of drugs. The study tested two hypotheses. First, the difference between the most successful and less successful drugs in any pharmacological class can be reliably detected by TJSI. Second, drugs with TJSI indicators as high as that of sumatriptan can be found among other pharmacological classes as well. Drugs from various pharmacological classes approved by the Federal Drug Administration (FDA) during the 10-year period, 1980-1989, were used in this study. Two groups of 10 drugs were selected to test the first hypothesis. One group included the most successful (breakthrough) drugs, the other included less successful drugs matched with the breakthrough drugs according to mechanism of action. The difference between the two groups was compared using three publication indices: the TJSI, the number of all types of articles on a drug in journals presented by Medline (AJI), and the number of articles covering only randomized controlled trials (RCT). It was found that TJSI can detect the difference between the two groups of drugs better than the two other indices. TJSI detected the difference between a breakthrough drug and its less successful counterpart at least 69% of the time with 95% confidence. With the other two indices the difference was not distinguishable from random chance. Some of the breakthrough drugs (zidovudine, omeprazole, lovastatin) have TSJIs as high or even higher than that of sumatriptan (19.2 vs. 23.0, 21.4, and 20.6, respectively). In conclusion, TJSI can be useful not only in the field of analgesics, but also with drugs belonging to other pharmacological classes.

Keywords: Bibliometric, Bibliometrics, Biomedical, Biomedical Journals, Drugs, Impact Factor, Journals, Publication, Randomized Controlled Trials, Scientometrics, Topic-Specific Publications

? Abramo, G., D’Angelo, C.A. and Viel, F. (2011), The field-standardized average impact of national research systems compared to world average: The case of Italy. *Scientometrics*, **88** (2), 599-615.

Full Text: [2011\Scientometrics88, 599.pdf](2011/Scientometrics88,%20599.pdf)

Abstract: The study presents a time-series analysis of field-standardized average impact of Italian research compared to the world average. The approach is purely bibliometric, based on census of the full scientific production from all Italian public research organizations active in 2001-2006 (hard sciences only). The analysis is conducted both at sectorial level (aggregated, by scientific discipline and for single fields within disciplines) and at organizational level (by type of organization and for single organizations). The essence of the methodology should be replicable in all other national contexts. Its offers support to policy-makers and administrators for strategic analysis aimed at identifying strengths and weaknesses of national research systems and institutions.

Keywords: Areas, Bibliometric, Bibliometrics, Field-Standardized Impact, Impact, Italy, Methodology, Productivity, Public Research Organizations, Research, Research Evaluation, Research Performance, Science, Scientific Impact

? Fu, J.Y., Zhang, X., Zhao, Y.H., Huang, M.H. and Chen, D.Z. (2011), Bibliometric analysis of complementary and alternative medicine research over three decades. *Scientometrics*, **88** (2), 617-626.

Full Text: [2011\Scientometrics88, 617.pdf](2011/Scientometrics88,%20617.pdf)

Abstract: This study applies bibliometric analysis to investigate the quantity and citation impact of scientific papers in the field of complementary and alternative medicine (CAM). The data are collected from 19 CAM journals in the Science Citation Index Expanded (SCI-E) database during 1980-2009, and 17,002 papers are identified for analysis. The study analyzes the document types, geographical and institutional distribution of the authorship, including international scientific collaboration. This study suggests that the major type of document is original article. The CAM papers are mostly published by North America, East Asia, and European countries, of which publications authored in East Asia are cited most. Country-wise, major contributors of CAM papers are from USA, People’s Republic of China, India, England and Germany. India has the highest CPP value, attracting high attentions in CAM community. This article also finds that international co-authorship in the CAM field has increased rapidly during this period. In addition, internationally collaborated publications generate higher citation impact than papers published by authors from single country. Finally, the research identifies productive institutions in CAM, and China Medical University located in Taiwan is the most productive organization.

Keywords: Alternative Medicine, Authors, Authorship, Bibliometric, Bibliometric Analysis, Cam, China, Citation, Citation Impact, Co-Authorship, Coauthorship, Collaboration, Complementary Medicine, England, Health, Impact, Journals, Papers, Promotion, Publications, Research, Science, Science Citation Index, University

? Gorraiz, J., Gumpenberger, C. and Wieland, M. (2011), Galton 2011 revisited: A bibliometric journey in the footprints of a universal genius. *Scientometrics*, **88** (2), 627-652.

Full Text: [2011\Scientometrics88, 627.pdf](2011/Scientometrics88,%20627.pdf)

Abstract: Commemorating the 100th death anniversary of Francis Galton, this paper is a bibliometric impact analysis of the works of this outstanding scientist and predecessor of scientometrics. Citation analysis was done in Web of Science, Scopus and Google Scholar (Publish or Perish) in order to retrieve the most cited books and journal articles. Additionally references were identified where Galton was rather mentioned than cited in order to analyze the phenomenon of obliteration by incorporation. Finally occurrence counts of Galton’s works in obituaries, Festschrift, the website Galton.org, major encyclopaedias and biographical indexes were compared to citation counts. As an outcome Galton’s works are increasingly cited or mentioned. Obliteration (use of eponyms) applies to one-third of Galton’s works and seems to be typical for fields like mathematics or statistics, whereas citations are more common in psychology. The most cited books and journal articles are also the most mentioned with remarkable correlation. Overall citation analysis and occurrence counting are complementary useful methods for the impact analysis of the works of “giants”.

Keywords: Bibliometric, Citation, Citation Analysis, Citation Counts, Citations, Francis Galton, Google Scholar, Historiometry, History of Science, Impact, Indexes, Journal, Men, Obliteration, Occurrence Counts, Publish or Perish, Science, Scientometrics, Scopus, Statistics, Web Of Science

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Full Text: [2011\Scientometrics88, 653.pdf](2011/Scientometrics88,%20653.pdf)

Abstract: Title of an article can be descriptive, declarative or a question. It plays important role in both marketing and findability of article. We investigate the impact of the type of article titles on the number of citations and downloads articles receive. Number of downloads and citations for all articles published in six of PLoS (Public Library of Science) journals (2,172 articles) were obtained from PLoS and type of each article’s title (including descriptive, indicative and question) was determined as well as the number of substantive words in title (title length). Statistical difference and correlation tests were carried out. The findings showed that differences exist between articles with different types of titles in terms of downloads and citations, especially articles with question titles tended to be downloaded more but cited less than the others. Articles with longer titles were downloaded slightly less than the articles with shorter titles. Titles with colon tended to be longer and receive fewer downloads and citations. As expected, number of downloads and citations were positively correlated.

Keywords: Article Titles, Articles, Citation, Citations, Colon, Colons, Download, Impact, Journals, Length, Science, Title Length, Words

? Egghe, L. (2011), Problems with “natural selection of academic papers”. *Scientometrics*, **88** (2), 663-667.

Full Text: [2011\Scientometrics88, 663.pdf](2011/Scientometrics88,%20663.pdf)

Abstract: In this short communication we give critical comments on the paper of Perakakis et al. (Scientometrics 85(2):553-559, 2010) on “Natural selection of academic papers”. The criticism mainly focusses on their unbalanced criticism of peer review and their negative evaluation of the link of peer review with commercial publishing.

Keywords: Commercial Publishing, Evaluation, Open Access, Peer Review, Publishing, Review, Scientometrics

? Perakakis, P., Taylor, M., Mazza, M.G. and Trachana, V. (2011), Understanding the role of open peer review and dynamic academic articles: Authors’ reply to “Problems with natural selection of academic papers”. *Scientometrics*, **88** (2), 669-673.

Full Text: [2011\Scientometrics88, 669.pdf](2011/Scientometrics88,%20669.pdf)

Abstract: We welcome the commentary by L. Egghe (Scientometrics, this issue) stimulating discussion on our recent article “Natural selection of academic papers” (NSAP) (Scientometrics, 85(2):553-559, 2010) that focuses on an important modern issue at the heart of the scientific enterprise-the open and continuous evaluation and evolution of research. We are also grateful to the editor of Scientometrics for giving us the opportunity to respond to some of the arguments by L. Egghe that we believe are inaccurate or require further comment.

Keywords: Academic Publishing, Commentary, Developing-Countries, Evaluation, Open Access, Open Peer Review, Peer Review, Research, Review, Science, Scientometrics

? Leydesdorff, L. (2011), Atlas of science: Visualizing what we know. *Scientometrics*, **88** (2), 675-677.

Full Text: [2011\Scientometrics88, 675.pdf](2011/Scientometrics88,%20675.pdf)

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Full Text: [2011\Scientometrics88, 679.pdf](2011/Scientometrics88,%20679.pdf)

Abstract: This paper shows the main lines of research concerning health and women, as registered in the Medline database, broken down into four 10-year periods: 1965-1974, 1975-1984, 1985-1994, and 1995-2005. The units of analysis used were the Medline “MeSH” major terms, processed by means of co-term analysis. For graphic representation, the social network approach was used, with pruning performed by Pathfinder Networks (PFNET), so as to concentrate the displays. Factor analysis was used to group the descriptors and identify the main lines of research involving health and women. The results show that research on Health and Women has increased and undergone significant changes over the past 40 years, yet such studies are not given due importance.

Keywords: Analysis, Author Cocitation Analysis, Co-Term, Female, Gender-Differences, Health, Illness, Management, Maps, Medline, Morbidity, Mortality, PFNET, Research, Science, Sex-Differences, Social, Social Network, Social Networks, Visualization, Women, Word Analysis

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Full Text: [2011\Scientometrics88, 707.pdf](2011/Scientometrics88,%20707.pdf)

Abstract: This article presents for the first time a portrait of intramural research conducted by the U.S. Department of Agriculture (USDA). We describe the nature, characteristics, and use of USDA research based on scientometric indicators using patent analysis and three bibliometric methods: publication analysis, citation analysis, and science mapping. Our analyses are intended to be purely descriptive in nature. They demonstrate that USDA maintains several core scientific competencies and its research is much broader than and reaches well beyond traditional agricultural sciences for which it is best known. We illustrate the current status, recent trends, and clear benchmarks for planning and assessing future USDA research across an array of scientific disciplines.

Keywords: Agriculture, Analysis, Bibliometric, Bibliometric Methods, Citation, Citation Analysis, Education, Extension, Federal Research, Impact, Indicators, Intramural Research, Mapping, Patent, Publication, Research, Research Benchmarking, Research Output, Science, Sciences, Traditional, Trends, USDA

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Full Text: [2011\Scientometrics-Dorta.pdf](2011/Scientometrics-Dorta.pdf); [2011\Scientometrics88, 729.pdf](2011/Scientometrics88,%20729.pdf)

Abstract: The citation distribution of a researcher shows the impact of their production and determines the success of their scientific career. However, its application in scientific evaluation is difficult due to the bi-dimensional character of the distribution. Some bibliometric indexes that try to synthesize in a numerical value the principal characteristics of this distribution have been proposed recently. In contrast with other bibliometric measures, the biases that the distribution tails provoke, are reduced by the h-index. However, some limitations in the discrimination among researchers with different publication habits are presented in this index. This index penalizes selective researchers, distinguished by the large number of citations received, as compared to large producers. In this work, two original sets of indexes, the central area indexes and the central interval indexes, that complement the h-index to include the central shape of the citation distribution, are proposed and compared.

Keywords: Bibliometric, Bibliometric Indexes, Bibliometric Indicators, Citation, Citation Analysis, Citations, Discrimination, Egghes G, Evaluation, h Index, h-Index, Hirschs h, Impact, Indexes, Output, Publication, Research Career Evaluation, Researchers, Scientific-Research, Success

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Full Text: [2011\Scientometrics88, 747.pdf](2011/Scientometrics88,%20747.pdf)

Abstract: The influence of the National Research Foundation’s (NRF) rating system on the productivity of the South African social science researchers is investigated scientometrically for the period from 1981 to 2006. Their output performance is mainly indicated by their research publications. Following international best practice in scientometrics as well as the behavioural reinforcement theory, we employed the “before/after control impact (BACI) method”, as well as the well known econometric breakpoint test as proposed by Chow. We use as control group the publications in the field of clinical medicine. The field is not supported by NRF and hence clinical medicine researchers are not affected by the evaluation and rating system. The findings show a positive impact of the NRF programme on the research outputs of social sciences researchers and the implementation of the programme has increased the relevant population of research articles by an average of 24.5% (during the first 5 years) over the expected number of publication without the programme. The results confirm the scientometric findings of other studies (e. g. that of Nederhof) that ratings promulgate research productivity.

Keywords: Africa, Assessment, Clinical Medicine, Control, Economics, Evaluation, Impact, Incentives, Medicine, Policy, Practice, Productivity, Programs, Publication, Publications, Quasi Experimental Design, Research, Research Policy, Research Productivity, Researchers, Science, Sciences, Scientometrics, Social, Social Sciences, South Africa, Theory

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Full Text: [2011\Scientometrics88, 761.pdf](2011/Scientometrics88,%20761.pdf)

Abstract: This paper provides an overview of the progression of technology structure based on patent co-citation networks. Methods of patent bibliometrics, social network analysis and information visualization are employed to analyze patents of Fortune 500 companies indexed in Derwent Innovations Index, the largest patent database in the world. Based on the co-citation networks, several main technology groups are identified, including Chemicals, Petroleum Refining, Motor Vehicles, Pharmaceuticals, Electronics, etc. Relationships among the leading companies and technology groups are also revealed.

Keywords: Analysis, Bibliometrics, Biotechnology, Classification, Cocitation, Fortune 500, Genetic-Engineering Research, Indicators, Information, Information Visualization, Innovations, Knowledge, Methods, Overview, Patent, Patent Bibliometrics, Patent Co-Citation, Pharmaceuticals, Progression, Sectors, Social, Social Network, Social Network Analysis, System, Technology Structure, Visualization

? Torres-Salinas, D., Moreno-Torres, J.G., Delgado-López-Cózar, E. and Herrera, F. (2011), A methodology for Institution-Field ranking based on a bidimensional analysis: The *IFQ*2*A* index. *Scientometrics*, **88** (3), 771-786.

Full Text: [2011\Scientometrics88, 771.pdf](2011/Scientometrics88,%20771.pdf)

Abstract: The problem of comparing academic institutions in terms of their research production is nowadays a priority issue. This paper proposes a relative bidimensional index that takes into account both the net production and the quality of it, as an attempt to provide a comprehensive and objective way to compare the research output of different institutions in a specific field, using journal contributions and citations. The proposed index is then applied, as a case study, to rank the top Spanish universities in the fields of Chemistry and Computer Science in the period ranging from 2000 until 2009. A comparison with the top 50 universities in the ARWU rankings is also made, showing the proposed ranking is better suited to distinguish among non-elite universities.

Keywords: Academic Rankings, Analysis, ARWU, Bibliometrics, Bidimensional Analysis, Chemistry, Citations, Evaluation Models, h-Index, Higher Education, Highly Cited Papers, Impact, Journal, Methodology, Ranking, Rankings, Research, Research Output, Research Performance Assessment, Research Production, Science, Shanghai Ranking, Spanish Universities, Universities

? Schubert, T. (2011), Assessing the value of patent portfolios: An international country comparison. *Scientometrics*, **88** (3), 787-804.

Full Text: [2011\Scientometrics88, 787.pdf](2011/Scientometrics88,%20787.pdf)

Abstract: Patent counts have been extensionally used to measure the innovative capacities of countries. However, since economic values of patents may differ, simple patent counts may give misleading rankings, if the patents of one country are on average more valuable than those of another. In the literature several methods have been proposed, which shall adjust for these differences. However, often these do not possess a solid economic micro-foundation and therefore are often ad-hoc and arbitrary procedures. In this paper, we intend to present an adjustment method that is based on the analysis of renewal decisions. The method builds on the theoretical model used in Schankerman and Pakes (1986) and Besson (2008) but goes beyond both approaches in that it recovers the important long tail of the value distribution. It also transfers Besson’s (2008) econometric methodology (applicable to the organisational structures of the US Patent and Trademark Office) also to the European Patent Office which is necessary, since each application here may split up into several national patent documents. The analysis is performed for 22 countries. Exemplarily, we find that in the cohort of 1986 patent applications, Danish patents are about 60% more valuable than the average patent. German patents are a bit below average. Japanese patents are of least value. In the cohort of 1996, Danish patents lose some of their lead but are still more valuable than the average. While German are a bit above average, Japanese patents even fall further behind (possibly due to the economic downturn in since the mid of 1990ies).

Keywords: Adjustment, Analysis, Citations, Country Comparison, Differences, Field, Indicators, Japanese, Lead, Literature, Methodology, Model, Patent, Patent Count, Rankings, Renewal Fees, Technology, US, Value

? Huang, M.C., Fang, S.C. and Chang, S.C. (2011), Tracking R&D behavior: Bibliometric analysis of drug patents in the Orange Book. *Scientometrics*, **88** (3), 805-818.

Full Text: [2011\Scientometrics88, 805.pdf](2011/Scientometrics88,%20805.pdf)

Abstract: The Publication Approved Drug Products with Therapeutic Equivalence Evaluations (commonly known as the Orange Book) identifies drug products approved by the United States Food and Drug Administration (USFDA) for safety and effectiveness, and provides substantial information on new drug applications (NDAs) with patent data. To explore the patterns among drug patents in the Orange Book, this study used patent bibliometric analysis. The productivity and impact are presented at the assignee level and applicant level, respectively, and the applicant’s patent portfolio is further discussed. 2,033 drug patents are identified in this current study. Our findings indicate that the applicant’s patent portfolio in the Orange Book is helpful in revealing the technological capability and patent strategy of the pharmaceutical incumbents. By linking drug data and patent information, this current study sheds light on patent research in the pharmaceutical industry.

Keywords: Administration, Analysis, Behavior, Bibliometric, Bibliometric Analysis, Biotechnology, Citations, Drug, Effectiveness, Evaluations, Firms, Genetic-Engineering Research, Impact, Industry, Information, Innovation, Ndas, Orange Book, Patent, Patent Sourcing, Perspective, Pharmaceutical Industry, Pharmaceutical-Industry, Productivity, Research, Safety, Science, Strategy, Technology

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Full Text: [2011\Scientometrics88, 819.pdf](2011/Scientometrics88,%20819.pdf)

Abstract: With the modern technology fast developing, most of entities can be observed by different perspectives. These multiple view information allows us to find a better pattern as long as we integrate them in an appropriate way. So clustering by integrating multi-view representations that describe the same class of entities has become a crucial issue for knowledge discovering. We integrate multi-view data by a tensor model and present a hybrid clustering method based on Tucker-2 model, which can be regarded as an extension of spectral clustering. We apply our hybrid clustering method to scientific publication analysis by integrating citation-link and lexical content. Clustering experiments are conducted on a large-scale journal set retrieved from the Web of Science (WoS) database. Several relevant hybrid clustering methods are cross compared with our method. The analysis of clustering results demonstrate the effectiveness of the proposed algorithm. Furthermore, we provide a cognitive analysis of the clustering results as well as the visualization as a mapping of the journal set.

Keywords: Analysis, Bibliometric Analysis, Combined Cocitation, Effectiveness, Hybrid, Hybrid Clustering, Information, Journal, Knowledge, Mapping, Model, Multi-View Data, Networks, Publication, Science, Scientific Publication, Singular-Value Decomposition, Tensor, Text, Text Mining, Visualization, Web of Science, Word Analysis, WOS

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Full Text: [2011\Scientometrics88, 841.pdf](2011/Scientometrics88,%20841.pdf); [2011\Scientometrics-Fu1.pdf](2011/Scientometrics-Fu1.pdf); [2011\Scientometrics-Fu.pdf](file:///F:/HO-reference/2011/Scientometrics-Fu.pdf)

Abstract: To provide an overview of the characteristics of research in China, a bibliometric evaluation of highly cited papers with high-level representation was conducted during the period from 1999 to 2009 based on the Essential Science Indicators (ESI) database. A comprehensive assessment covered overall performance, journals, subject categories, internationally collaborative countries, national inter-institutionally collaborative institutions, and most-cited papers in 22 scientific fields. China saw a strong growth in scientific publications in the last decade, to some extent due to increasing research and development expenditure. China has been more active in ESI fields of chemistry and physics, but more excellent in materials science, engineering and mathematics. Most publications were concerned with the common Science Citation Index subject categories of multidisciplinary chemistry, multidisciplinary materials and science, and physical chemistry. About one half China’s ESC papers were internationally collaborative and the eight major industrialized countries (the USA, Germany, the UK, Japan, France, Canada, Russia, and Italy) played a prominent role in scientific collaboration with China, especially the USA. The Chinese Academy of Sciences took the leading position of institutions with many branches. The “985 Project” stimulated the most productive institutions for academic research with a huge funding injection and the universities in Hong Kong showed good scientific performance. The citation impact of internationally collaborative papers differed among fields and international collaborations made positive contributions to academic research in China.

Keywords: Assessment, Basic Research, Bibliometric, Bibliometric Analysis, Bibliometric Analysis, Canada, China, Citation, Citation Impact, Citation-Classics, Collaboration, Development, ESI, Essential Science Indicator, Evaluation, France, Funding, Germany, Growth, Highly Cited Papers, Highly-Cited, Hong Kong, Impact, Indicators, Italy, Japan, Journals, Overview, Papers, Publications, Research, Research and Development, Research Performance, Science, Science Citation Index, Scientific Collaboration, Scientific Publications, Scientometric Analysis, Sociology, Top-Cited Articles, Trends, UK

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Full Text: [2011\Scientometrics88, 863.pdf](2011/Scientometrics88,%20863.pdf)

Abstract: This paper suggests a method for Subject-Action-Object (SAO) network analysis of patents for technology trends identification by using the concept of function. The proposed method solves the shortcoming of the keyword-based approach to identification of technology trends, i.e., that it cannot represent how technologies are used or for what purpose. The concept of function provides information on how a technology is used and how it interacts with other technologies; the keyword-based approach does not provide such information. The proposed method uses an SAO model and represents “key concept” instead of “key word”. We present a procedure that formulates an SAO network by using SAO models extracted from patent documents, and a method that applies actor network theory to analyze technology implications of the SAO network. To demonstrate the effectiveness of the SAO network this paper presents a case study of patents related to Polymer Electrolyte Membrane technology in Proton Exchange Membrane Fuel Cells.

Keywords: Actor Network Theory, Analysis, Co-Word Analysis, Co-Word Analysis, Effectiveness, Fields, Function, Information, Level, Model, Network Theory, Patent, Patent Analysis, Patent Mining, Polymer, Product, Research-And-Development, Scientometrics, Technology Subject-Action-Object (SAO), Technology Trends Analysis, Theory, Tool, Trends

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Full Text: [2011\Scientometrics88, 885.pdf](2011/Scientometrics88,%20885.pdf)

Abstract: In academia, the term “inbreeding” refers to a situation wherein PhDs are employed in the very same institution that trained them during their doctoral studies. Academic inbreeding has a negative perception on the account that it damages both scientific effectiveness and productivity. In this article, the effect of inbreeding on scientific effectiveness is investigated through a case study. This problem is addressed by utilizing Hirsch index as a reliable metric of an academic’s scientific productivity. Utilizing the dataset, constructed with academic performance indicators of individuals from the Mechanical and Aeronautical Engineering Departments, of the Turkish Technical Universities, we demonstrate that academic inbreeding has a negative impact on apparent scientific effectiveness through a negative binomial model. This model appears to be the most suitable one for the dataset which is a type of count data. We report chi-square statistics and likelihood ratio test for the parameter alpha. According to the chi-square statistics the model is significant as a whole. The incidence rate ratio for the variable “inbreeding” is estimated to be 0.11 and this ratio tells that, holding all the other factors constant, for the inbred faculty, the h-index is about 89% lower when compared to the non-inbred faculty. Furthermore, there exists negative and statistically significant correlation with an individual’s productivity and the percentage of inbred faculty members at the very same department. Excessive practice of inbreeding adversely affects the overall productivity. Decision makers are urged to limit this practice to a minimum in order to foster a vibrant research environment. Furthermore, it is also found that scientific productivity of an individual decreases towards the end of his scientific career.

Keywords: Academic Inbreeding, Chi-Square, Effectiveness, Environment, Faculty, h Index, h-Index, Hirsch Index, Hirsch-Index, Impact, Incidence, Likelihood Ratio, Model, Perception, Performance Indicators, Practice, Productivity, Ratio, Research, Scientific Effectiveness, Scientific Productivity, Statistics, Turkish Universities, Universities

? Lapon-Kandelshein, E. and Prebor, G. (2011), Bibliographical research in the study of Hebrew printing: A bibliometric analysis. *Scientometrics*, **88** (3), 899-913.

Full Text: [2011\Scientometrics88, 899.pdf](2011/Scientometrics88,%20899.pdf)

Abstract: The study presents the state of bibliographical research in the discipline of Hebrew printing during a 30-year period, ranging from the latter quarter of the twentieth century until the beginning of the third millennium (1976-2006). Through bibliographical parameters it characterizes the publications dealing with Hebrew printing, examines whether the published material exhibits laws and systematic regularities that are consistent with Bibliometrics, and describes directions in which the field has developed.

Keywords: Analysis, Bibliography, Bibliometric, Bibliometric Analysis, Bibliometrics, Hebrew Printing, Law, Publications, Research, Systematic

? Abramo, G., D’Angelo, C.A. and Di Costa, F. (2011), Research productivity: Are higher academic ranks more productive than lower ones? *Scientometrics*, **88** (3), 915-928.

Full Text: [2011\Scientometrics88, 915.pdf](2011/Scientometrics88,%20915.pdf)

Abstract: This work analyses the links between individual research performance and academic rank. A typical bibliometric methodology is used to study the performance of all Italian university researchers active in the hard sciences, for the period 2004-2008. The objective is to characterize the performance of the ranks of full (FPs), associate and assistant professors (APs), along various dimensions, in order to verify the existence of performance differences among the ranks in general and for single disciplines.

Keywords: Academic Rank, Bibliometric, Bibliometrics, Differences, Italy, Methodology, Productivity, Publication, Research, Research Performance, Research Productivity, Researchers, Sciences, Universities, University

? Nikolic, N., Bagliniere, J.L., Rigaud, C., Gardes, C., Masquilier, M.L. and Taverny, C. (2011), Bibliometric analysis of diadromous fish research from 1970s to 2010: A case study of seven species. *Scientometrics*, **88** (3), 929-947.

Full Text: [2011\Scientometrics88, 929.pdf](2011/Scientometrics88,%20929.pdf)

Abstract: The aim of this study was to explore the research trends and the evolution of publications covered on diadromous fish from 1970s to 2010. We conducted a bibliometric analysis on seven patrimonial species: Atlantic salmon (Salmo salar), Brown and Sea trout (Salmon trutta), Allis shad (Alosa alosa), Twaite shad (Alosa fallax), Eel (Anguilla Anguilla), Sea lamprey (Petromyzon marinus) and River lamprey (Lampetra fluviatilis). We used bibliometric techniques on the total number of research (articles, books, and conferences) in all country in function of main fields such as growth/age, reproduction, migration, habitat, aquaculture, diseases, diet, abundance, fisheries, climate change, toxicology, dams/fishways, genetics, taxonomy, modelling, resource management, and stocking. The results revealed a clear difference in the evolution of scientific studies by species and by countries. The analysis comparisons showed the intensity of certain topics by species with the emergence of new ones, the economic impact on sciences and the increased support of conservation plan management for certain species, such as salmon and lamprey in France. This study also emerged that French research is not always consistent with the international trend which suggests the dominance of management systems on scientific studies.

Keywords: Analysis, Anguilla-Anguilla, Atlantic Salmon, Bibliometric, Bibliometric Analysis, Climate Change, Clustering, Conservation, Diadromous Fish, Diet, Ecology, European Eel, Evolution, Fish, France, Genetics, History, Impact, Lampetra-Planeri Bloch, Management, Modelling, Norway, Publications, Reproduction, Research, Research Trends, River, Salmon Salmo-Salar, Sciences, Topics, Trend, Trends

? Hu, M.C. (2011), Evolution of knowledge creation and diffusion: the revisit of Taiwan’s Hsinchu Science Park. *Scientometrics*, **88** (3), 949-977.

Full Text: [2011\Scientometrics88, 949.pdf](?%20Hu,%20M.C.%20(2011),%20Evolution%20of%20knowledge%20creation%20and%20diffusion:%20the%20revisit%20of%20Taiwan’s%20Hsinchu%20Science%20Park.%20Scientometrics,%2088%20(3),%20949-977.)

Abstract: The Hsinchu Science Park in Taiwan has been synonymous with dynamic and flourishing high-tech industries and companies since the 1980s. Using patent citation data, this empirical study shows that Taiwan’s Hsinchu Science Park is a healthy and knowledge-based cluster surrounded by the semiconductor sector, in which external knowledge is continuously playing an important role, while internalized capability is building up quickly; new and extended industrial clusters are being established by the growth of new ventures; and the linkages of capital, manpower, and technology flows are conducted respectively by the large business groups, the NTHU and NCTU, and the ITRI in the region. Subsequent sectors, repeating the successful model created by and catalyzed from the semiconductor sector are flourishing; the thin-film transistor-liquid crystal display (TFT-LCD) and integrated circuit (IC) design sectors have been growing rapidly since the beginning of the 2000s, and the solar photovoltaic and LED (Light-Emitting Diode) sectors emerged quickly in mid-2005. The continuous evolving and growing industries along with the significant increase of value added in the Hsinchu Science Park have demonstrated it is acting as a healthy and vivid innovation region. The policy implications derived from this study can thus shed light, for the Southeast Asian, Latin American or other latecomers, on the strategies for formulating regional research and innovation policies in the process of developing a knowledge-based economy.

Keywords: Catch-Up, Citation, Design, Diffusion, Evolution, Flow, Growth, Industries, Industry, Innovation, Knowledge, Knowledge Flows, Korea, Latin American, Model, Networks, Patent, Patent Citation, Patent Citations, Policies, Policy, Region Innovation System, Research, Research-And-Development, Science, Science Park, Taiwan, Technology, USA

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Full Text: [2011\Scientometrics88, 979.pdf](2011/Scientometrics88,%20979.pdf)

Abstract: This paper by using data envelopment analysis (DEA) and statistical inference evaluates the citation performance of 229 economic journals. The paper categorizes the journals into four main categories (A-D) based on their efficiency levels. The results are then compared to the 27 “core economic journals” as introduced by Diamond (Curr Contents 21(1):4-11, 1989). The results reveal that after more than 20 years Diamonds’ list of “core economic journals” is still valid. Finally, for the first time the paper uses data from four well-known databases (SSCI, Scopus, RePEc, Econlit) and two quality ranking reports (Kiel Institute internals ranking and ABS quality ranking report) in a DEA setting and in order to derive the ranking of 229 economic journals. The ten economic journals with the highest citation performance are Journal of Political Economy, Econometrica, Quarterly Journal of Economics, Journal of Financial Economics, Journal of Economic Literature, American Economic Review, Review of Economic Studies, Journal of Econometrics, Journal of Finance, Brookings Papers on Economic Activity.

Keywords: Analysis, Bootstrap, Citation, Coverage, Data Envelopment Analysis, Databases, Economic Journals, Economics, Google Scholar, Indexes, Indexing Techniques, Indicators, Journal, Journals, Literature, Nonparametric Frontier Models, Ranking, Ranking Journals, Relative Impacts, Review, Scopus, SSCI, Statistical, Web-of-Science

? Egghe, L. (2011), The single publication h-index and the indirect h-index of a researcher. *Scientometrics*, **88** (3), 1003-1004.

Full Text: [2011\Scientometrics88, 1003.pdf](2011/Scientometrics88,%201003.pdf)

Abstract: The single publication h-index, introduced by A. Schubert in 2009 can be applied on all articles in the Hirsch-core of a researcher. In this way one can define the “indirect h-index” of a researcher.

Keywords: h Index, h-Index, Indirect h-Index, Publication, Single Publication h-Index

? Prathap, G. (2011), Letter to the Editor: Comments on the paper of Franceschini and Maisano: Proposals for evaluating the regularity of a scientist’s research output. *Scientometrics*, **88** (3), 1005-1010.

Full Text: [2011\Scientometrics88, 1005.pdf](2011/Scientometrics88,%201005.pdf)

Keywords: Index, Research, Research Output

? Opthof, T. and Leydesdorff, L. (2011), A comment to the paper by Waltman et al., Scientometrics, 87, 467-481, 2011. *Scientometrics*, **88** (3), 1011-1016.

Full Text: [2011\Scientometrics88, 1011.pdf](2011/Scientometrics88,%201011.pdf)

Abstract: In reaction to a previous critique (Opthof and Leydesdorff, J Informetr 4(3):423-430, 2010), the Center for Science and Technology Studies (CWTS) in Leiden proposed to change their old “crown” indicator in citation analysis into a new one. Waltman (Scientometrics 87:467-481, 2011a) argue that this change does not affect rankings at various aggregated levels. However, CWTS data is not publicly available for testing and criticism. Therefore, we comment by using previously published data of Van Raan (Scientometrics 67(3):491-502, 2006) to address the pivotal issue of how the results of citation analysis correlate with the results of peer review. A quality parameter based on peer review was neither significantly correlated with the two parameters developed by the CWTS in the past citations per paper/mean journal citation score (CPP/JCSm) or CPP/FCSm (citations per paper/mean field citation score) nor with the more recently proposed h-index (Hirsch, Proc Natl Acad Sci USA 102(46):16569-16572, 2005). Given the high correlations between the old and new “crown” indicators, one can expect that the lack of correlation with the peer-review based quality indicator applies equally to the newly developed ones.

Keywords: Analysis, Citation, Citation Analysis, Citations, Excellence, h Index, h-Index, Impact, Index, Indicator, Indicators, Journal, Output, Peer Review, Peer-Review, Performance, Quality, Rankings, Review, Science, Scientometrics, Selection, Selection, USA

? Waltman, L., van Eck, N.J., van Leeuwen, T.N., Visser, M.S. and van Raan, A.F.J. (2011), On the correlation between bibliometric indicators and peer review: Reply to Opthof and Leydesdorff. *Scientometrics*, **88** (3), 1017-1022.

Full Text: [2011\Scientometrics88, 1017.pdf](2011/Scientometrics88,%201017.pdf)

Abstract: Opthof and Leydesdorff (Scientometrics, 2011) reanalyze data reported by Van Raan (Scientometrics 67(3):491-502, 2006) and conclude that there is no significant correlation between on the one hand average citation scores measured using the CPP/FCSm indicator and on the other hand the quality judgment of peers. We point out that Opthof and Leydesdorff draw their conclusions based on a very limited amount of data. We also criticize the statistical methodology used by Opthof and Leydesdorff. Using a larger amount of data and a more appropriate statistical methodology, we do find a significant correlation between the CPP/FCSm indicator and peer judgment.

Keywords: Bibliometric, Bibliometric Indicator, Bibliometric Indicators, Citation, Citation Analysis, Correlation, Hand, Index, Methodology, Peer Review, Peer-Review, Review, Scientometrics, Statistical

? Teixeira, A.A.C. (2011), Mapping the (in)visible college(s) in the field of entrepreneurship. *Scientometrics*, **89** (1), 1-36.

Full Text: [2011\Scientometrics89, 1.pdf](2011/Scientometrics89,%201.pdf)

Abstract: Despite the vitality and dynamism that the field of entrepreneurship has experienced in the last decade, the issue of whether it comprises an effective network of (in)formal communication linkages among the most influential scholars within the area has yet to be examined in depth. This study follows a formal selection procedure to delimit the ‘relational environment’ of the field of entrepreneurship and to analyze the existence and characterization of (in)visible college(s) based on a theoretically well-grounded framework, thus offering a comprehensive and up-to-date empirical analysis of entrepreneurship research. Based on more than a 1,000 papers published between 2005 and 2010 in seven core entrepreneurship journals and the corresponding (85,000) citations, we found that entrepreneurship is an (increasingly) autonomous, legitimate and cohesive (in)visible college, fine tuned through the increasing visibility of certain subject specialties (e.g., family business, innovation, technology and policy). Moreover, the rather dense formal links that characterize the entrepreneurship (in)visible college are accompanied by a reasonably solid network of informal relations maintained and sustained by the mobility of ‘stars’ and highly influential scholars. The limited internationalization of the entrepreneurship community, reflected in the almost total absence of non-English-speaking authors/studies/outlets, stands as a major quest for the field.

Keywords: Analysis, Bibliometrics, Bibliometrics, Characterization, Citation, Citations, Cocitation Analysis, Communication, Depth, Entrepreneurship, Environment, Family, Future, Innovation, Invisible College, Invisible College, Journals, Nanotechnology, Network, Papers, Policy, Research, Scholarship, Social-Science, Visibility

? Finardi, U. (2011), Time relations between scientific production and patenting of knowledge: The case of nanotechnologies. *Scientometrics*, **89** (1), 37-50.

Full Text: [2011\Scientometrics89, 37.pdf](2011/Scientometrics89,%2037.pdf)

Abstract: Nanosciences and nanotechnologies are considered important for the development of science, technology and innovation, and the study of their characters can be a great help to the decisions of policy makers and of practitioners. This work is centred on the issue of the time relations between science and technology/innovation, and in particular on the speed of transfer of science-generated knowledge towards its exploitation in patenting. A methodology based on patent citations is used in order to measure the time lag between cited journal articles and citing patent, and thus the time proximity between the two steps. Keywords regarding nanotechnology/nanoscience items are searched in order to collect data useful for the analysis. Collateral measures, performed on another class of materials and on the spatial origin of citing/cited documents, help giving evidence of the peculiarity of the behaviour and on its nature. The most representative time lag between production of scientific knowledge and its technological exploitation appears being around 3-4 years.

Keywords: Analysis, Citations, Data Mining, Development, Field, Innovation, Journal, Journal Article, Knowledge, Knowledge Diffusion, Methodology, Nano-Science, Nanoscience, Nanosciences, Nanotechnologies, Patent, Patent-Research Relations, Policy, Science, Scientific Production, Technological Trajectories, Technology, Terms, Time

? Zhao, L.M. and Zhang, Q.P. (2011), Mapping knowledge domains of Chinese digital library research output, 1994-2010. *Scientometrics*, **89** (1), 51-87.

Full Text: [2011\Scientometrics89, 51.pdf](2011/Scientometrics89,%2051.pdf)

Abstract: The aim of this paper is to identify the research paradigms on digital libraries in China while compared with that of international digital libraries research via scientometric analysis. Co-word network constructed by keywords in documents and their co-occurrence relationships is a kind of mapping knowledge domains, which represents the cognitive and intellectual structure of science. A total of 6068 and 1250 papers published between 1994 and 2010 were, respectively retrieved from the China National Knowledge Infrastructure (CNKI) and ScienceDirect databases with a topic search of digital libraries or digital library in abstracts of papers. This paper uses methods of co-word analysis, social network analysis and mapping knowledge domains as theory basis, with assistance of softwares of UCINET and Netdraw, to construct the co-word network of digital libraries/library research in China, present the study status quo and evolution on digital libraries/library in China and analyze the research paradigm structure of digital libraries/library in China.

Keywords: Analysis, China, Co-Word Analysis, Databases, Digital Libraries, Digital Libraries, Library Research, Evolution, Intellectual Structure, Knowledge, Knowledge Domains, Mapping, Mapping Knowledge Domains, Papers, Research, Research Output, Science, Scientometric Analysis, Social, Social Network, Social Network Analysis, Theory

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Full Text: [2011\Scientometrics89, 89.pdf](2011/Scientometrics89,%2089.pdf)

Abstract: This study builds the interdisciplinary knowledge network of China, which is used to catch the knowledge exchange structure of disciplines, and investigates the evolution process from 1981 to 2010. A network analysis was performed to examine the special structure and we compare state of the networks in different periods to determine how the network has got such properties. The dataset are get from the reference relationship in literature on important Chinese academic journals from 1980 to 2010. The analytical results reveal the hidden network structure of interdisciplinary knowledge flows in China and demonstrate that the network is highly connected and has a homogeneous link structure and heterogeneous weight distribution. Through comparing of the network in three periods, that is 1981-1990, 1991-2000 and 2001-2010, we find that the special evolution process, which is limited by the number of nodes, play an important influence on interdisciplinary knowledge flows.

Keywords: Analysis, China, Citation, Collaboration, Complex Networks, Dynamics, Evolution, Evolution, Flow, Interdisciplinary Knowledge Network, Journals, Knowledge, Literature, Network Analysis, Structure, Transdisciplinary Research

? Nguyen, T.V. and Pham, L.T. (2011), Scientific output and its relationship to knowledge economy: An analysis of ASEAN countries. *Scientometrics*, **89** (1), 107-117.

Full Text: [2011\Scientometrics89, 107.pdf](2011/Scientometrics89,%20107.pdf)

Abstract: This article seeks to examine the relationship between scientific output and knowledge economy index in 10 South East Asian countries (ASEAN). Using bibliometric data of the Institute of Scientific Information, we analyzed the number of scientific articles published in international peer-reviewed journals between 1991 and 2010 for Vietnam, Cambodia, Laos, Thailand, Myanmar, Malaysia, Indonesia, Brunei, the Philippines, and Singapore. During the 20-year period, scientists from the ASEAN countries have published 165,020 original articles in ISI indexed journals, which represents similar to 0.5% of the world scientific output. Singapore led the region with the highest number of publications (accounting for 45% of the countries’ total publications), followed by Thailand (21%), Malaysia (16%), Vietnam (6%), Indonesia and the Philippines (5% each). The number of scientific articles from those countries has increased by 13% per year, with the rate of increase being highest in Thailand and Malaysia, and lowest in Indonesia and the Philippines. At the country level, the correlation between knowledge economy index and scientific output was 0.94. Based on the relationship between scientific output and knowledge economy, we identified 4 clusters of countries: Singapore as the first group; Thailand and Malaysia in the second group; Vietnam, Indonesia and the Philippines in the third group; and Cambodia, Laos, Myanmar and Brunei in the fourth group. These data suggested that there was a strong relationship between scientific research and the degree of “knowledgization” of economy.

Keywords: Analysis, Asean, Bibliometric, Bibliometric Analysis, China, Index, Indonesia, ISI, Journals, Knowledge, Knowledge Economy, Malaysia, Publications, Research, Science, Scientific Information, Scientific Output, Scientific Publication, Scientific Research, World

? Onel, S., Zeid, A. and Kamarthi, S. (2011), The structure and analysis of nanotechnology co-author and citation networks. *Scientometrics*, **89** (1), 119-138.

Full Text: [2011\Scientometrics89, 119.pdf](2011/Scientometrics89,%20119.pdf)

Abstract: Research activities and collaborations in nanoscale science and engineering have major implications for advancing technological frontiers in many fields including medicine, electronics, energy, and communication. The National Nanotechnology Initiative (NNI) promotes efforts to cultivate effective research and collaborations among nano scientists and engineers to accelerate the advancement of nanotechnology and its commercialization. As of August 2008, there have been over 800 products considered to benefit from nanotechnology directly or indirectly. However, today’s accomplishments in nanotechnology cannot be transformed into commercial products without productive collaborations among experts from disparate research areas such as chemistry, physics, math, biology, engineering, manufacturing, environmental sciences, and social sciences. To study the patterns of collaboration, we build and analyze the collaboration network of scientists and engineers who conduct research in nanotechnology. We study the structure of information flow through citation network of papers authored by nano area scientists. We believe that the study of nano area co-author and paper citation networks improve our understanding of patterns and trends of the current research efforts in this field. We construct these networks based on the publication data collected for years ranging 1993 through 2008 from the scientific literature database “Web of Science”. We explore those networks to find out whether they follow power-law degree distributions and/or if they have a signature of hierarchy. We investigate the small-world characteristics and the existence of possible community structures in those networks. We estimate the statistical properties of the networks and interpret their significance with respect to the nano field.

Keywords: Activities, Analysis, Biology, Citation, Citation Network, Citation Networks, Co-Author Network, Collaboration, Communication, Complex Networks, Dynamics, Energy, Environmental, Environmental Sciences, Information, Internet, Literature, Medicine, Nano Technology, Nanotechnology, Papers, Publication, Research, Science, Sciences, Small-World Networks, Social, Social Sciences, Statistical, Trends, Wide-Web

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Full Text: [2011\Scientometrics89, 139.pdf](2011/Scientometrics89,%20139.pdf)

Abstract: This study is based on the fact that the surnames of many Russian scientists have gender endings, with “a” denoting a female, so that the sex of most of them can be readily determined from the listing of authors in the Web of Science (WoS). A comparison was made between the proportion of females in 1985, 1995, and 2005, with a corresponding analysis of the major fields in which they worked, their propensity to co-author papers internationally (which often necessitates having the opportunity to travel to conferences abroad to meet possible colleagues), and their citation records. We found, as expected, that women had a higher presence in the biological sciences and a very low presence in engineering, mathematics, and physics. Their citation scores, on a fractionated basis, were lower than those for men in almost all fields and years, and were not explained by their writing of fewer reviews and papers in English (both of which lead to higher citations), or their lower amount of international collaboration in 1995 and 2005 after Russia had become a more open society.

Keywords: Analysis, Authors, Authorship, Bibliometric Analysis, Bibliometrics, Cancer-Research, Citation, Citations, Collaboration, Female, Gender, Gender-Gap, International Collaboration, Journals, Lead, Men, Papers, Researchers, Russia, Science, Sciences, Scientific Productivity, Sex, Surnames, Technology, Web of Science, Women, Women Scientists, WOS, Writing

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Full Text: [2011\Scientometrics89, 153.pdf](2011/Scientometrics89,%20153.pdf)

Abstract: Composite indicators play an essential role for benchmarking higher education institutions. One of the main sources of uncertainty building composite indicators and, undoubtedly, the most debated problem in building composite indicators is the weighting schemes (assigning weights to the simple indicators or subindicators) together with the aggregation schemes (final composite indicator formula). Except the ideal situation where weights are provided by the theory, there clearly is a need for improving quality assessment of the final rank linked with a fixed vector of weights. We propose to use simulation techniques to generate random perturbations around any initial vector of weights to obtain robust and reliable ranks allowing to rank universities in a range bracket. The proposed methodology is general enough to be applied no matter the weighting scheme used for the composite indicator. The immediate benefit achieved is a reduction of the uncertainty associated with the assessment of a specific rank which is not representative of the real performance of the university, and an improvement of the quality assessment of composite indicators used to rank. To illustrate the proposed methodology we rank the French and the German universities involved in their respective 2008 Excellence Initiatives.

Keywords: Assessment, Benchmarking, Composite, Composite Indicators, Education, Excellence, Higher Education, Higher Education Institutions, Methodology, Rankings, Reduction, Simulation, Simulation Techniques, Theory, University, Vector, Weighting Schemes

? Costas, R., van Leeuwen, T.N. and van Raan, A.F.J. (2011), The “Mendel syndrome” in science: Durability of scientific literature and its effects on bibliometric analysis of individual scientists. *Scientometrics*, **89** (1), 177-205.

Full Text: [2011\Scientometrics89, 177.pdf](2011/Scientometrics89,%20177.pdf)

Abstract: The obsolescence and “durability” of scientific literature have been important elements of debate during many years, especially regarding the proper calculation of bibliometric indicators. The effects of “delayed recognition” on impact indicators have importance and are of interest not only to bibliometricians but also among research managers and scientists themselves. It has been suggested that the “Mendel syndrome” is a potential drawback when assessing individual researchers through impact measures. If publications from particular researchers need more time than “normal” to be properly acknowledged by their colleagues, the impact of these researchers may be underestimated with common citation windows. In this paper, we answer the question whether the bibliometric indicators for scientists can be significantly affected by the Mendel syndrome. Applying a methodology developed previously for the classification of papers according to their durability (Costas et al., J Am Soc Inf Sci Technol 61(8):1564-1581, 2010a; J Am Soc Inf Sci Technol 61(2):329-339, 2010b), the scientific production of 1,064 researchers working at the Spanish Council for Scientific Research (CSIC) in three different research areas has been analyzed. Cases of potential “Mendel syndrome” are rarely found among researchers and these cases do not significantly outperform the impact of researchers with a standard pattern of reception in their citations. The analysis of durability could be included as a parameter for the consideration of the citation windows used in the bibliometric analysis of individuals.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Citation, Citations, CSIC, Discoveries, Durability, Half-Life, Highly Cited Papers, Impact, Indicators, Individual Level Analysis, Interest, Journals, Literature, Mendel Syndrome, Methodology, Micro-Level Analysis, Obsolescence, Papers, Publications, Reception, Research, Research Performance, Researchers, Resistance, Science, Scientific Production

? Duffy, R.D., Jadidian, A., Webster, G.D. and Sandell, K.J. (2011), The research productivity of academic psychologists: Assessment, trends, and best practice recommendations. *Scientometrics*, **89** (1), 207-227.

Full Text: [2011\Scientometrics89, 207.pdf](2011/Scientometrics89,%20207.pdf)

Abstract: Research productivity affects the careers of academic psychologists. Unfortunately, there is a surprising lack of consensus on productivity’s meaning, measurement, and how to compare the productivity of one academic psychologist to another. In the present study, we review academic productivity research within psychology, and using a sample of 673 psychologists, compute six indexes of productivity. Most productivity metrics (publication count, citation count, or some combination of the two) were substantially interrelated and one (Integrated Research Productivity Index) was independent from years in the field. Female psychologists were equally as productive as male psychologists after accounting for years in the field, and pre-tenure psychologists showed steeper change-over-time productivity slopes than post-tenure psychologists. Based on these findings, we provide recommendations for the use and measurement of academic research productivity.

Keywords: Academic Psychologists, Assessment, Citation, Counseling-Psychology, Educational-Psychologists, Female, Gender, Indexes, Institutional Research Productivity, Job-Performance, Journals, Male, Management, Measurement, Metrics, Personality, Practice, Productivity, Publication, Publication Productivity, Recommendations, Research, Research Productivity, Review, Scholarly Productivity, Trends

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Full Text: [2011\Scientometrics89, 229.pdf](2011/Scientometrics89,%20229.pdf)

Abstract: Here we show a longitudinal analysis of the overall prestige of first quartile journals during the period between 1999 and 2009, on the subject areas of Scopus. This longitudinal study allows us to analyse developmental trends over times in different subject areas with distinct citation and publication patterns. To this aim, we first introduce an axiomatic index of the overall prestige of journals with ranking score above a given threshold. Here we demonstrate that, between 1999 and 2009, there was high and increasing overall prestige of first quartile journals in only four areas of Scopus. Also, there was high and decreasing overall prestige of first quartile journals in five areas. Two subject areas showed high and oscillating overall prestige of first quartile journals. And there was low and increasing overall prestige in four areas, since the 1999.

Keywords: Analysis, Axiomatic Index, Bibliometric Analysis, Citation, First Quartile Journals, Impact, Journals, Longitudinal Analysis, Longitudinal Study, Overall Prestige, Poverty, Publication, Publication Analysis, Ranking, Ranking Methods, Scopus, Trends

? Wu, Q. and Wolfram, D. (2011), The influence of effects and phenomena on citations: A comparative analysis of four citation perspectives. *Scientometrics*, **89** (1), 245-258.

Full Text: [2011\Scientometrics89, 245.pdf](2011/Scientometrics89,%20245.pdf)

Abstract: This article defines different perspectives for citations and introduces four concepts: Self-expected Citations, Received Citations, Expected Citations, and Deserved Citations. When comparing permutations of these four classes of perspectives, there are up to 145 kinds of equality/inequality relations. From these numerous relations, we analyze the difference between the Matthew Effect and the Matthew Phenomenon. We provide a precise definition and point out that many previous empirical research studies on the Matthew Effect based on citations belong primarily to the Matthew Phenomenon, and not the true meaning of the Matthew Effect. Due to the difficulty in determining the Deserved Citations, the Matthew Effect is in itself difficult to measure, although it is commonly believed to influence citation counts. Furthermore, from the theoretical facts, we outline four new effects/phenomena: the Self-confidence Effect/Phenomenon, the Narcissus Effect/Phenomenon, the Other-confidence Effect/Phenomenon, and the Flattery Effect/Phenomenon, and we discuss additional influencing factors.

Keywords: Analysis, Article, Authorship, Citation, Citation Analysis, Citation Counts, Citations, Citing Behavior, Counts, Impact, Index, Lotka Law, Matthew Core Journals, Matthew Effect, Property, Research, Scholarly Communication, Science

? Jang, S.L., Yu, Y.C. and Wang, T.Y. (2011), Emerging firms in an emerging field: An analysis of patent citations in electronic-paper display technology. *Scientometrics*, **89** (1), 259-272.

Full Text: [2011\Scientometrics89, 259.pdf](2011/Scientometrics89,%20259.pdf)

Abstract: USPTO patent data covering the years 1994-2008 is used in this study to examine the citation networks of electronic-paper display technology. Our primary aim is to provide a better understanding of the ways in which emerging firms interact with, and learn from, technology diffusers. Two implications can be drawn from our analysis. Firstly, emerging firms within an emerging industry can enhance their technological capabilities through positive external learning activity. Secondly, despite the fact that technology diffusers have clear technological advantages, with the emergence of a new field, their influence within the network could potentially be decayed if they fail to remain proactive in terms of the absorption of available external knowledge.

Keywords: Absorption, Analysis, Centrality, Citation, Citation Networks, Citations, Electronic-Paper Display Technology, Emerging Field, Industry, Innovation, Knowledge, Knowledge Spillovers, Learning, Networks, Patent, Patent Citation, Primary, Research-And-Development

? Kissin, I. (2011), A surname-based bibliometric indicator: Publications in biomedical journal. *Scientometrics*, **89** (1), 273-280.

Full Text: [2011\Scientometrics89, 273.pdf](2011/Scientometrics89,%20273.pdf)

Abstract: Surnames have been used as a proxy in studies on health care for various ethnic groups and also applied to ascribe ethnicity in studies on the genetic structure of a population. The aim of this study was to use a surname-based bibliometric indicator to assess the representation of Jewish authors in US biomedical journals. The other aim was to test the hypothesis that the representation of Jewish authors in US biomedical journals corresponds to their representation among US Nobel Prize winners in Medicine, 1960-2009. From among articles published 1960-2009 in all journals covered by Medline (> 5,000), and in the top 10 US biomedical journals we counted articles by authors from the following three groups: Kohenic-Levitic surnames, other common Jewish surnames, and the most frequent non-Jewish surnames in the USA. The frequency of a surname in the US population (1990 US Census) was used to calculate the expected number of scientific publications: the total number of published articles multiplied by a surname’s frequency. The actual number of articles with that surname was also determined. The ratio of actual to expected number of articles was used as a measure of representation proportionality. It was found that the ratio of actual to expected number of articles in both Jewish groups is close to 10 among all (> 5,000) journals, and close to 20 in the top 10 journals. The ratio of actual to expected numbers of Jewish Nobel Laureates in the USA is also close to 20. In conclusion, the representation of Jewish authors in top 10 US biomedical journals corresponds to the representation of Jewish Nobel Laureates among US laureates. We hypothesize that disproportional representation of Jewish scientists as authors in top biomedical journals and among Nobel Prize laureates in Medicine is mostly due to their overrepresentation as research participants, not because of the increased chances for reward for a Jewish researcher per se.

Keywords: Authors, Bibliometric, Bibliometrics, Biomedical, Biomedical Journals, Care, Databases, Ethnicity, Frequency, Genetic, Health Care, Impact Factor, Journal, Journals, Medline, Names, Nobel Prize, Publication Productivity, Publications, Ratio, Research, Scientific Publications, Surnames, US, USA

? Trimble, V. and Ceja, J.A. (2011), Are American astrophysics papers accepted more quickly than others? Part I. *Scientometrics*, **89** (1), 281-289.

Full Text: [2011\Scientometrics89, 281.pdf](2011/Scientometrics89,%20281.pdf)

Abstract: It has been shown that papers in stem cell research submitted from institutions in the USA are accepted faster than those submitted from elsewhere and that the cause might at least partly be some bias in the refereeing process. We investigate whether there is a similar difference in time scale for papers in astronomy, astrophysics, and cosmology and look briefly at some of the possible causes. We find a publication time lag of 3.8 days (out of a median time of 105 days) while in the stem cell case it is 24 days out of a median of 83 days. One of many possible causes is a difference in how useful the papers are to the community, and we will assess this in a second paper making use of citation analysis.

Keywords: Analysis, Astronomical Journals, Bias, Citation, Citation Analysis, Citations, Einstein, Papers, Publication, Publications, Research, Space, USA

? Tol, R.S.J. (2011), Credit where credit’s due: accounting for co-authorship in citation counts. *Scientometrics*, **89** (1), 291-299.

Full Text: [2011\Scientometrics89, 291.pdf](2011/Scientometrics89,%20291.pdf)

Abstract: I propose a new method (Pareto weights) to objectively attribute citations to co-authors. Previous methods either profess ignorance about the seniority of co-authors (egalitarian weights) or are based in an ad hoc way on the order of authors (rank weights). Pareto weights are based on the respective citation records of the co-authors. Pareto weights are proportional to the probability of observing the number of citations obtained. Assuming a Pareto distribution, such weights can be computed with a simple, closed-form equation but require a few iterations and data on a scholar, her co-authors, and her co-authors’ co-authors. The use of Pareto weights is illustrated with a group of prominent economists. In this case, Pareto weights are very different from rank weights. Pareto weights are more similar to egalitarian weights but can deviate up to a quarter in either direction (for reasons that are intuitive).

Keywords: Authors, Citation, Citation Counts, Citations, Co-Authors, Co-Authorship, Coauthorship, Index, Law, Lotka, Pareto Distribution

? Waltman, L., Yan, E. and van Eck, N.J. (2011), A recursive field-normalized bibliometric performance indicator: An application to the field of library and information science. *Scientometrics*, **89** (1), 301-314.

Full Text: [2011\Scientometrics89, 301.pdf](2011/Scientometrics89,%20301.pdf)

Abstract: Two commonly used ideas in the development of citation-based research performance indicators are the idea of normalizing citation counts based on a field classification scheme and the idea of recursive citation weighing (like in PageRank-inspired indicators). We combine these two ideas in a single indicator, referred to as the recursive mean normalized citation score indicator, and we study the validity of this indicator. Our empirical analysis shows that the proposed indicator is highly sensitive to the field classification scheme that is used. The indicator also has a strong tendency to reinforce biases caused by the classification scheme. Based on these observations, we advise against the use of indicators in which the idea of normalization based on a field classification scheme and the idea of recursive citation weighing are combined.

Keywords: Analysis, Audience Factor, Bibliometric, Bibliometric Indicator, Citation, Citation Analysis, Citation Counts, Citation Impact, Development, Eigenfactor, Excellence, Field Normalization, Information, Information Science, Pagerank, Performance Indicators, Recursive Indicator, Research, Research Performance, Science, Search, Tools, Validity

? Franceschini, F. and Maisano, D. (2011), On the analogy between the evolution of thermodynamic and bibliometric systems: A breakthrough or just a bubble? *Scientometrics*, **89** (1), 315-327.

Full Text: [2011\Scientometrics89, 315.pdf](2011/Scientometrics89,%20315.pdf)

Abstract: This paper presents an in depth study of an interesting analogy, recently proposed by Prathap (Scientometrics 87(3):515-524, 2011a), between the evolution of thermodynamic and bibliometric systems. The goal is to highlight some weaknesses and clarify some “dark sides” in the conceptual framework of this analogy, discussing the formal validity and practical meaning of the concepts of Energy, Exergy and Entropy in bibliometrics. Specifically, this analogy highlights the following major criticalities: (1) the definitions of E and X are controversial, (2) the equivalence classes of E and X are questionable, (3) the parallel between the evolution of thermodynamic and bibliometric systems is forced, (4) X is a non-monotonic performance indicator, and (5) in bibliometrics the condition of “thermodynamic perfection” is questionable. Argument is supported by many analytical demonstrations and practical examples.

Keywords: Bibliometric, Bibliometrics, Composite Indicators, Definitions, Depth, Energy, Entropy, Evolution, Exergy, h-Index, Journals, P-Index, S = E - X, Scientometrics, Thermodynamic, Thermodynamics, Validity

? Zitt, M. (2011), Behind citing-side normalization of citations: Some properties of the journal impact factor. *Scientometrics*, **89** (1), 329-344.

Full Text: [2011\Scientometrics89, 329.pdf](2011/Scientometrics89,%20329.pdf)

Abstract: A new family of citation normalization methods appeared recently, in addition to the classical methods of “cited-side” normalization and the iterative measures of intellectual influence in the wake of Pinski and Narin influence weights. These methods have a quite global scope in citation analysis but were first applied to the journal impact, in the experimental Audience Factor (AF) and the Scopus Source-Normalized Impact per Paper (SNIP). Analyzing some properties of the Garfield’s Journal Impact Factor, this note highlights the rationale of citing-side (or source-level, fractional citation, ex ante) normalization.

Keywords: Analysis, Citation, Citation Analysis, Citation Normalization, Citations, Citing-Side Normalization, Experimental, Family, Impact, Impact Factor, Indicators, Journal, Journal Impact Factor, Performance, Scopus, Source-Level Normalization

? Borner, K., Glänzel, W., Scharnhorst, A. and van den Besselaar, P. (2011), Modeling science: Studying the structure and dynamics of science. *Scientometrics*, **89** (1), 347-348.

Full Text: [2011\Scientometrics89, 347.pdf](2011/Scientometrics89,%20347.pdf)

Keywords: Modeling, Science

? Mutschke, P., Mayr, P., Schaer, P. and Sure, Y. (2011), Science models as value-added services for scholarly information systems. *Scientometrics*, **89** (1), 349-364.

Full Text: [2011\Scientometrics89, 349.pdf](2011/Scientometrics89,%20349.pdf)

Abstract: The paper introduces scholarly Information Retrieval (IR) as a further dimension that should be considered in the science modeling debate. The IR use case is seen as a validation model of the adequacy of science models in representing and predicting structure and dynamics in science. Particular conceptualizations of scholarly activity and structures in science are used as value-added search services to improve retrieval quality: a co-word model depicting the cognitive structure of a field (used for query expansion), the Bradford law of information concentration, and a model of co-authorship networks (both used for re-ranking search results). An evaluation of the retrieval quality when science model driven services are used turned out that the models proposed actually provide beneficial effects to retrieval quality. From an IR perspective, the models studied are therefore verified as expressive conceptualizations of central phenomena in science. Thus, it could be shown that the IR perspective can significantly contribute to a better understanding of scholarly structures and activities.

Keywords: Activities, Bradford Law, Centrality, Citation, Co-Authorship, Co-Authorship Networks, Coauthorship, Evaluation, Information, Information Systems, International Collaboration, IR, Model, Modeling, Networks, Query Expansion, Re-Ranking, Retrieval, Retrieval System, Science, Science Models, Scientific Collaboration, Validation, Value-Added Services

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Full Text: [2011\Scientometrics89, 365.pdf](2011/Scientometrics89,%20365.pdf)

Abstract: A quantitative modification to keep the number of published papers invariant under multiple authorship is suggested. In those cases, fractional allocations are attributed to each co-author with a summation equal to one. These allocations are tailored on the basis of each author contribution. It is denoted “Tailor Based Allocations (TBA)” for multiple authorship. Several protocols to TBA are suggested. The choice of a specific TBA may vary from one discipline to another. In addition, TBA is applied to the number of citations of a multiple author paper to have also this number conserved. Each author gets only a specific fraction of the total number of citations according to its fractional paper allocation. The equivalent of the h-index obtained by using TBA is denoted the gh-index. It yields values which differ drastically from those given by the h-index. The gh-index departs also from (h) over bar recently proposed by Hirsh to account for multiple authorship. Contrary to the h-index, the gh-index is a function of the total number of citations of each paper. A highly cited paper allows a better allocation for all co-authors while a less cited paper contributes essentially to one or two of the co-authors. The scheme produces a substantial redistribution of the ranking of scientists in terms of quantitative records. A few illustrations are provided.

Keywords: Author, Authorship, Citations, Consequences, Contribution, Fractional Allocations, h Index, h-Index, h-Index, Highly-Cited, Hirsch-Index, Impact, Modification, Multiauthored Publications, Multiple Authorship, Papers, Quantitative, Ranking, TBA

? Evans, T.S., Lambiotte, R. and Panzarasa, P. (2011), Community structure and patterns of scientific collaboration in Business and Management. *Scientometrics*, **89** (1), 381-396.

Full Text: [2011\Scientometrics89, 381.pdf](2011/Scientometrics89,%20381.pdf)

Abstract: This paper investigates the role of homophily and focus constraint in shaping collaborative scientific research. First, homophily structures collaboration when scientists adhere to a norm of exclusivity in selecting similar partners at a higher rate than dissimilar ones. Two dimensions on which similarity between scientists can be assessed are their research specialties and status positions. Second, focus constraint shapes collaboration when connections among scientists depend on opportunities for social contact. Constraint comes in two forms, depending on whether it originates in institutional or geographic space. Institutional constraint refers to the tendency of scientists to select collaborators within rather than across institutional boundaries. Geographic constraint is the principle that, when collaborations span different institutions, they are more likely to involve scientists that are geographically co-located than dispersed. To study homophily and focus constraint, the paper will argue in favour of an idea of collaboration that moves beyond formal co-authorship to include also other forms of informal intellectual exchange that do not translate into the publication of joint work. A community-detection algorithm for formalising this perspective will be proposed and applied to the co-authorship network of the scientists that submitted to the 2001 Research Assessment Exercise in Business and Management in the UK. While results only partially support research-based homophily, they indicate that scientists use status positions for discriminating between potential partners by selecting collaborators from institutions with a rating similar to their own. Strong support is provided in favour of institutional and geographic constraints. Scientists tend to forge intra-institutional collaborations; yet, when they seek collaborators outside their own institutions, they tend to select those who are in geographic proximity. The implications of this analysis for tie creation in joint scientific endeavours are discussed.

Keywords: Analysis, Assessment, Co-Authorship, Coauthorship, Collaboration, Collaboration Networks, Community Structure, Complex Networks, Exercise, Geographic, Geographic Distance, Geography, Intra- and Inter-Institutional Collaborations, Joint, Knowledge, Management, Publication, Research, Research Specialty, Science, Scientific Collaboration, Scientific Research, Social, Social Network, Teams, UK

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Full Text: [2011\Scientometrics89, 397.pdf](2011/Scientometrics89,%20397.pdf)

Abstract: We develop a model of scientific creativity and test it in the field of rare diseases. Our model is based on the results of an in-depth case study of the Rett Syndrome. Archival analysis, bibliometric techniques and expert surveys are combined with network analysis to identify the most creative scientists. First, we compare alternative measures of generative and combinatorial creativity. Then, we generalize our results in a stochastic model of socio-semantic network evolution. The model predictions are tested with an extended set of rare diseases. We find that new scientific collaborations among experts in a field enhance combinatorial creativity. Instead, high entry rates of novices are negatively related to generative creativity. By expanding the set of useful concepts, creative scientists gain in centrality. At the same time, by increasing their centrality in the scientific community, scientists can replicate and generalize their results, thus contributing to a scientific paradigm.

Keywords: Analysis, Bibliometric, Bibliometric Indicators, Biomedical Research, Brokerage, Centrality, Co-Authorship Network, Collaboration, Creativity, Emergence, Evolution, Ideas, Industry, Innovation, Mathematical Approach, Model, Performance, Perspective, Qualitative And Quantitative Method, Scientific Collaboration

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Full Text: [2011\Scientometrics89, 421.pdf](2011/Scientometrics89,%20421.pdf)

Abstract: This study presents a mixed model that combines different indicators to describe and predict key structural and dynamic features of emerging research areas. Three indicators are combined: sudden increases in the frequency of specific words; the number and speed by which new authors are attracted to an emerging research area, and changes in the interdisciplinarity of cited references. The mixed model is applied to four emerging research areas: RNAi, Nano, h-Index, and Impact Factor research using papers published in the Proceedings of the National Academy of Sciences of the United States of America (1982-2009) and in Scientometrics (1978-2009). Results are compared in terms of strengths and temporal dynamics. Results show that the indicators are indicative of emerging areas and they exhibit interesting temporal correlations: new authors enter the area first, then the interdisciplinarity of paper references increases, then word bursts occur. All workflows are reported in a manner that supports replication and extension by others.

Keywords: Authors, Burst Detection, Communication, Discovery, Emergence, Emerging Trend, Facts, Figures, Frequency, h Index, h-Index, Impact, Impact Factor, Interdisciplinarity, Model, Nano, Papers, Prediction, Publication Output, Relative Citation Impact, Research, Science, Science of Science (SCI(2)) Tool, Scientometrics, Technology, Temporal Dynamics, Tracking

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Full Text: [2011\Scientometrics89, 437.pdf](2011/Scientometrics89,%20437.pdf)

Abstract: Agent-based simulation can model simple micro-level mechanisms capable of generating macro-level patterns, such as frequency distributions and network structures found in bibliometric data. Agent-based simulations of organisational learning have provided analogies for collective problem solving by boundedly rational agents employing heuristics. This paper brings these two areas together in one model of knowledge seeking through scientific publication. It describes a computer simulation in which academic papers are generated with authors, references, contents, and an extrinsic value, and must pass through peer review to become published. We demonstrate that the model can fit bibliometric data for a token journal, Research Policy. Different practices for generating authors and references produce different distributions of papers per author and citations per paper, including the scale-free distributions typical of cumulative advantage processes. We also demonstrate the model’s ability to simulate collective learning or problem solving, for which we use Kauffman’s NK fitness landscape. The model provides evidence that those practices leading to cumulative advantage in citations, that is, papers with many citations becoming even more cited, do not improve scientists’ ability to find good solutions to scientific problems, compared to those practices that ignore past citations. By contrast, what does make a difference is referring only to publications that have successfully passed peer review. Citation practice is one of many issues that a simulation model of science can address when the data-rich literature on scientometrics is connected to the analogy-rich literature on organisations and heuristic search.

Keywords: Author, Authors, Bibliometric, Citation, Citation Distribution, Citations, Computer, Computer Simulation, Cumulative Advantage, Frequency, Journal, Knowledge, Landscape Search, Learning, Literature, Mechanisms, Model, Networks, Optimization, Papers, Peer Review, Peer-Review, Policy, Practice, Publication, Publications, Research, Review, Rugged Landscapes, Science, Science Models, Science Policy, Scientific Publication, Scientometrics, Simulation, Strategies

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Full Text: [2011\Scientometrics89, 564.pdf](2011/Scientometrics89,%20564.pdf)

Abstract: The correlation between GDP and research publications is an important issue in scientometrics. This article provides further empirical evidence connecting revealed comparative advantage in national research with effects on economic productivity. Using quantitative time series analysis, this study attempts to determine the nature of causal relationships between research output and economic productivity. One empirical result is that there is mutual causality between research and economic growth in Asia, whereas in Western countries the causality is much less clear. The results may be of use to underdeveloped nations deciding how to direct their academic investment and industry policy.

Keywords: Analysis, Asia, Autoregressive Time-Series, Causality, Countries, Economic Productivity, GDP, Granger Causality, Growth, Industry, Policy, Productivity, Publications, Quantitative, Research, Research Output, Scientometric Indicators, Scientometrics, Time Series Analysis, Unit-Root

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Full Text: [2011\Scientometrics89, 479.pdf](2011/Scientometrics89,%20479.pdf)

Abstract: Agent-based computing is a diverse research domain concerned with the building of intelligent software based on the concept of “agents”. In this paper, we use Scientometric analysis to analyze all sub-domains of agent-based computing. Our data consists of 1,064 journal articles indexed in the ISI web of knowledge published during a 20 year period: 1990-2010. These were retrieved using a topic search with various keywords commonly used in sub-domains of agent-based computing. In our proposed approach, we have employed a combination of two applications for analysis, namely Network Workbench and CiteSpace-wherein Network Workbench allowed for the analysis of complex network aspects of the domain, detailed visualization-based analysis of the bibliographic data was performed using CiteSpace. Our results include the identification of the largest cluster based on keywords, the timeline of publication of index terms, the core journals and key subject categories. We also identify the core authors, top countries of origin of the manuscripts along with core research institutes. Finally, our results have interestingly revealed the strong presence of agent-based computing in a number of non-computing related scientific domains including Life Sciences, Ecological Sciences and Social Sciences.

Keywords: Agent-Based Modeling, Analysis, Author Cocitation, Authors, Bibliographic, Citation, Citespace, Dynamics, Individual-Based Modeling, Innovation, Intellectual Structure, ISI, Journal, Journals, Knowledge, Multiagent Systems, Network, Publication, Research, Science, Sciences, Scientific Literatures, Scientometrics, Scientometrics, Social Sciences, Software, Survey, Triple-Helix, Visualization

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Full Text: [2011\Scientometrics89, 501.pdf](2011/Scientometrics89,%20501.pdf)

Abstract: This paper analyses the growth pattern of Nanoscience and Nanotechnology literature in India during 1990-2009 (20 years). The Scopus international multidisciplinary bibliographical database has been used to identify the Indian contributions on the field of nanoscience and nanotechnology. The study measures the performance based on several parameters, country annual growth rate, authorship pattern, collaborative index, collaborative coefficient, modified collaborative coefficient, subject profile, etc. Further the study examines national publication output and impact in terms of average citations per paper, international collaboration output and share, contribution and impact of Indian Institutions and impact of Indian journals.

Keywords: Analysis, Authorship, Authorship Pattern, Bibliographical Database, Citations, Collaboration, Collaborative Coefficient H-Index, Contribution, Exploration, Field, G-Index, G-Index, Growth, Growth Pattern, Impact, India, Interdisciplinarity, International Collaboration, Journals, Literature, Modified, Nanoscience, Nanotechnology, P-Index, Patent Citations, Profile, Publication, Publication Output, Publications, Research, Research Collaboration, Science, Scientific Literature, Scientometric Analysis, Scopus, Technology

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Full Text: [2011\Scientometrics89, 523.pdf](2011/Scientometrics89,%20523.pdf)

Abstract: As they are used to evaluate the importance of research at different levels by funding agencies and promotion committees, bibliometric indices have received a lot of attention from the scientific community over the last few years. Many bibliometric indices have been developed in order to take into account aspects not previously covered. The result is that, nowadays, the scientific community faces the challenge of selecting which of this pool of indices meets the required quality standards. In view of the vast number of bibliometric indices, it is necessary to analyze how they relate to each other (irrelevant, dependent and so on). Our main purpose is to learn a Bayesian network model from data to analyze the relationships among bibliometric indices. The induced Bayesian network is then used to discover probabilistic conditional (in) dependencies among the indices and, also for probabilistic reasoning. We also run a case study of 14 well-known bibliometric indices on computer science and artificial intelligence journals.

Keywords: Artificial Intelligence, Attention, Bayesian Networks, Bibliometric, Bibliometric Indices, Citation Analysis, Computer, Computer Science and Artificial Intelligence, Conditional Dependencies and Conditional Independencies, Funding, h-Index, Impact, Induced, Journals, Model, Network, Probabilistic Networks, Promotion, R-Index, Research, Science, Standards

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Full Text: [2011\Scientometrics89, 553.pdf](2011/Scientometrics89,%20553.pdf)

Abstract: This paper aims at analyzing and extracting the research groups from the co-authorship network of oncology in China. By use of centrality, component analysis, K-Core, M-Slice, Hierarchical Clustering analysis, and Multidimensional Scaling analysis, we studied the data from 10 Core Chinese Oncology journals between 2000 and 2009, analyzed the structure character of the Chinese Oncology research institutes. This study advances the methods for selecting the most prolific research groups and individuals in Chinese Oncology research community, and provides basis for more productive cooperation in the future. This study also provides scientific evidences and suggestions for policymakers to establish a more efficient system for managing and financing Chinese Oncology research in the future.

Keywords: Analysis, Centrality, China, Clustering, Clustering Analysis, Co-Authorship, Coauthorship, Cooperation, Field, Journals, Library, Network, Oncology, Research, Research Collaboration, Research Group, Research Groups, Science

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Full Text: [2011\Scientometrics89, 569.pdf](2011/Scientometrics89,%20569.pdf)

Abstract: This paper analyzes whether methods from social network analysis can be adopted for the modeling of scientific fields in order to obtain a better understanding of the respective scientific area. The approach proposed is based on articles published within the respective scientific field and certain types of nodes deduced from these papers, such as authors, journals, conferences and organizations. As a proof of concept, the techniques discussed here are applied to the field of ‘Mobile Social Networking’. For this purpose, a tool was developed to create a large data collection representing the aforementioned field. The paper analyzes various views on the complete network and discusses these on the basis of the data collected on Mobile Social Networking. The authors demonstrate that the analysis of particular subgraphs derived from the data collection allows the identification of important authors as well as separate sub-disciplines such as classic network analysis and sensor networks and also contributes to the classification of the field of ‘Mobile Social Networking’ within the greater context of computer science, applied mathematics and social sciences. Based on these results, the authors propose a set of concrete services which could be offered by such a network and which could help the user to deal with the scientific information process. The paper concludes with an outlook upon further possible research topics.

Keywords: Algorithm, Analysis, Author Co-Citation Networks, Author Cocitation Analysis, Authors, Co-Authorship Networks, Computer, Conference-Person Networks, Data Collection, Domain-Analysis, Index, Information, Information-Science, Intellectual Structure, Journal-Person Networks, Journals, Mapping Authors, Mobile Social Networking, Modeling, Modeling of A Scientific Domain, Network, Papers, Pearsons R, Person-Organization Networks, Research, Research Topics, Saltons Cosine, Science, Sciences, Scientific Information, Social, Social Network, Social Network Analysis, Social Networks, Social Sciences, Subgraph Isomorphism, Topics

? Tsay, M.Y. (2011), A bibliometric analysis and comparison on three information science journals: JASIST, IPM, JOD, 1998-2008. *Scientometrics*, **89** (2), 591-606.

Full Text: [2011\Scientometrics89, 591.pdf](2011/Scientometrics89,%20591.pdf)

Abstract: Employing a citation analysis, this study explored and compared the bibliometric characteristics and the subject relationship with other disciplines of and among the three leading information science journals, Journal of the American Society for Information Science and Technology (JASIST), Information Processing and Management and Journal of Documentation. The citation data were drawn from references of each article of the three journals during 1998 and 2008. The Ulrich’s Periodical Directory, Library of Congress Subject Heading, retrieved from the WorldCat, and LISA database were used to identify the main class, subclass and subject of cited journals and books. Quantitative results on the number of JASIST, IPM and JOD literature references, average number of references cited per paper, document type of cited literature and the journal self-citation rate are reported. Moreover, the highly cited journals and books, the main classes and subclasses of cited journals and books in papers of the three journals, the highly cited subjects in journals and books of library and information science were identified and analyzed. Comparison on the characteristics of cited journals and books confirmed that all the three journals under study are information science oriented, except JOD which is library science orientation. JASIST and IPM are very much in common and diffuse to other disciplines more deeply than JOD.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Study, Citation, Citation Analysis, Cited Books, Cited Journals, Highly-Cited, Information, Information Processing And Management (IPM), Information Science, Journal, Journal of Documentation, Journal of Documentation (JOD), Journal of The American Society for Information Science and Technology (JASIST), Journals, Library, Library Science, Literature, Management, Papers, References, Science, Self-Citation, Subject Analysis

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Full Text: [2011\Scientometrics89, 607.pdf](2011/Scientometrics89,%20607.pdf)

Abstract: The assessment of individual researchers using bibliometric indicators is more complex than that of a region, country or university. For large scientific bodies, averages over a large number of researchers and their outputs is generally believed to give indication of the quality of the research work. For an individual, the detailed peer evaluation of his research outputs is required and, even this, may fail in the short term to make a final, long term assessment of the relevance and originality of the work. Scientometrics assessment at individual level is not an easy task not only due to the smaller number of publications that are being evaluated, but other factors can influence significantly the bibliometric indicators applied. Citation practices vary widely among disciplines and sub disciplines and this may justify the lack of good bibliometric indicators at individual level. The main goal of this study was to develop an indicator that considers in its calculation some of the aspects that we must take into account on the assessment of scientific performance at individual level. The indicator developed, the h(nf) index, considers the different cultures of citation of each field and the number of authors per publication. The results showed that the h(nf) index can be used on the assessment of scientific performance of individual researchers and for following the performance of a researcher.

Keywords: Assessment, Authors, Authorship, Bibliometric, Bibliometric Indicators, Citation, Citer Motivations, Evaluation, h Index, h-Index, Impact, Impact Indicator, Individuals, Normalization, Originality, Peer Evaluation, Publication, Publications, Research, Research Work, Researchers, Scientific Performance, Scientometrics, Scientometrics Assessment, Self-Citation, University

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Full Text: [2011\Scientometrics89, 631.pdf](2011/Scientometrics89,%20631.pdf)

Abstract: This paper presents the journal relative impact (JRI), an indicator for scientific evaluation of journals. The JRI considers in its calculation the different culture of citations presented by the Web of Science subject categories. The JRI is calculated considering a variable citation window. This citation window is defined taking into account the time required by each subject category for the maturation of citations. The type of document considered in each subject category depends on its outputs in relation to the citations. The scientific performance of each journal in relation to each subject category that it belongs to is considered allowing the comparison of the scientific performance of journals from different fields. The results obtained show that the JRI can be used for the assessment of the scientific performance of a given journal and that the SJR and SNIP should be used to complement the information provided by the JRI. The JRI presents good features as stability over time and predictability.

Keywords: Assessment, Citation, Citations, Culture, Evaluation, Impact, Index, Information, Journal, Journal Impact, Journals, Normalization, Research Performance, Science, Scientific Literature, Scientific Performance, Scopus, SJR, Stability, Subject Category, System, Variable Window, Web of Science, Web-of-Science

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Full Text: [2011\Scientometrics89, 653.pdf](2011/Scientometrics89,%20653.pdf)

Abstract: The increasing literature addressing international mobility of researchers has repeatedly pointed out the lack of empirical data compiled over the last two decades, jeopardizing progress in the understanding of the characteristics and impacts of such human flows. This paper makes a contribution to the field by exploring the extent to which information obtained from researchers’ electronic curriculum vitae (CV) may be used to study temporary geographical mobility. We exploit a new type of data set-a comprehensive database of electronic CVs-developing a broad set of cross-discipline mobility indicators to assess the dimensions and characteristics of international research visits among a population of over 10,000 researchers. The sample population is made up of PhD holders working in the regional research system of Andalusia, Spain. Information regarding their international research visits over the last four decades is downloaded from CVs contained in the electronic scientific information system of the region. We assess mobility rates and the characteristics of the temporary mobile population. The analysis of visiting patterns shows significant differences in mobility profiles in terms of frequency, duration and destination of visits, across disciplines, career stages and time periods. The study also shows how different definitions of international mobility lead to substantial variations in cross-discipline mobility rates.

Keywords: Analysis, Brain Circulation, Careers, Contribution, Curriculum Vitae, Curriculum Vitae Analysis, Cv Analysis, Definitions, Differences, Frequency, Human, Information, Knowledge, Lead, Literature, Mobility Indicators, Mobility of Researchers, Performance, Policy, Productivity, Research, Researchers, Scientific Information, Scientists, Spain

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Full Text: [2011\Scientometrics89, 677.pdf](2011/Scientometrics89,%20677.pdf)

Abstract: In the near future, Brazil is expected to face a number of challenges with regards to economic and social development, and scientific production is a critical aspect of this development process. Over the past 30 years, there has been an almost 18-fold increase in the number of brazilian papers published, up from about 2,000 in 1980 to more than 35,000 in 2009. In this study we analyze the evolution of scientific production in terms of input (resources and permanent investigators) and output (scientific papers and doctorate graduates). We evaluate whether structural investments and the number of investigators at universities are both able to explain the increase in the number of papers, by investigating the relationships among growth rates in investments and the quantity of the papers published, as well as the number of doctorate graduates and active permanent investigators. As an indication of the fluctuations in investments pertaining to academic research, we consider the budget history of the largest Brazilian federal agencies charged with providing academic grants. We observe that the burgeoning number of papers has occurred independently of investments and the number of established investigators, thus suggesting an increase in the efficiency of Brazilian scientific output. Moreover, this increase in efficiency has occurred in conjunction with an increased number of Doctoral graduates per year. In this context, we propose that an evaluation of the academic structure is necessary in order to ascertain the risks of this increased “efficiency”. Moreover, the recent cut of over US$ 1 billion announced by the Brazilian government may jeopardize the quality of scientific output in the future.

Keywords: Brazil, Development, English, Evaluation, Evolution, Face, Federal Grant Entities, Financial Support, Growth, History, Impact, Inputs and Outputs, Investigators, Papers, PhD Programs, Research, Science, Scientific Output, Scientific Production, Social, Universities

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Full Text: [2011\Scientometrics89, 687.pdf](2011/Scientometrics89,%20687.pdf)

Abstract: Several studies exist which use scientific literature for comparing scientific activities (e. g., productivity, and collaboration). In this study, using co-authorship data over the last 40 years, we present the evolutionary dynamics of multi level (i.e., individual, institutional and national) collaboration networks for exploring the emergence of collaborations in the research field of “steel structures”. The collaboration network of scientists in the field has been analyzed using author affiliations extracted from Scopus between 1970 and 2009. We have studied collaboration distribution networks at the micro-, meso-and macro-levels for the 40 years. We compared and analyzed a number of properties of these networks (i.e., density, centrality measures, the giant component and clustering coefficient) for presenting a longitudinal analysis and statistical validation of the evolutionary dynamics of “steel structures” collaboration networks. At all levels, the scientific collaborations network structures were central considering the closeness centralization while betweenness and degree centralization were much lower. In general networks density, connectedness, centralization and clustering coefficient were highest in marco-level and decreasing as the network size grow to the lowest in micro-level. We also find that the average distance between countries about two and institutes five and for authors eight meaning that only about eight steps are necessary to get from one randomly chosen author to another.

Keywords: Activities, Analysis, Author, Authors, Centrality, Co-Authorship, Co-Authorship Analysis, Coauthorship, Collaboration, Collaborations, Dynamic Network Analysis, Evolutionary Collaboration Networks, Index, Literature, Multi-Levels and Cross-Time Analysis, Network, Patterns, Productivity, Research, Science, Scientific Activities, Scientific Collaboration, Scopus, Self-Organization, Social Network Analysis, Statistical, Validation

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Full Text: [2011\Scientometrics89, 711.pdf](2011/Scientometrics89,%20711.pdf)

Abstract: In the last two decades international collaboration in the Eastern European academic communities has strongly intensified. Scientists from developed countries within the European Union play a key role in stimulating the international collaboration of academics in this region. In addition, many of the research projects that engage East-European scholars are only possible in the framework of the large European programmes. The present study focuses on the role of EU and other developed nations as a partner of these countries and the analysis of the performance of collaborative research as reflected by the citation impact of internationally co-authored publications.

Keywords: Academics, Analysis, Bibliometric, Bibliometric Analysis, Citation, Citation Impact, Citations, Co-Authorship, Collaboration, Eastern Europe, EU, Growth, Impact, International Collaboration, Journal, Publications, Research, Scientists

? Soos, S. (2011), The functional anatomy of science mapping Katy Borner: Atlas of science: visualizing what we know. The MIT Press, Cambridge, MA/London, UK, 2010, US$20. *Scientometrics*, **89** (2), 723-726

Full Text: [2011\Scientometrics89, 723.pdf](2011/Scientometrics89,%20723.pdf)

Keywords: Anatomy, Functional, Mapping, Science, UK

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Full Text: [2011\Scientometrics89, 727.pdf](2011/Scientometrics89,%20727.pdf)

Abstract: the single publication H-index of Schubert is applied to the papers in the Hirsch-core of a researcher, journal or topic. Four practical examples are given and regularities are explained: the regression line of the single publication h-index of the ranked papers in the Hirsch-core is decreasing. We propose two measures of indirect citation impact: the average of the single publication h-indices of the papers in the Hirsch-core and the h-index of these single publication H-indices, defined as the indirect h-index. Formulae for these indirect citation impact measures are given in the Lotkaian context.

Keywords: Citation, Citation Impact, h Index, h-Index, Hirsch Core, Impact, Indirect h-Index, Indirect Impact Measure, Journal, Papers, Publication, Single Publication h-Index

? Gomez-Nunez, A.J., Vargas-Quesada, B., de Moya-Anegon, F. and Glanzel, W. (2011), Improving SCImago Journal & Country Rank (SJR) subject classification through reference analysis. *Scientometrics*, **89** (3), 741-758.

Full Text: [2011\Scientometrics89, 741.pdf](2011/Scientometrics89,%20741.pdf)

Abstract: In order to re-categorize the SCImago Journal & Country Rank (SJR) journals based on Scopus, as well as improve the SJR subject classification scheme, an iterative process built upon reference analysis of citing journals was designed. the first step entailed construction of a matrix containing citing journals and cited categories obtained through the aggregation of cited journals. Assuming that the most representative categories in each journal would be represented by the highest citation values regarding categories, the matrix vectors were reduced using a threshold to discern and discard the weakest relations. the process was refined on the basis of different parameters of a heuristic nature, including (1) the development of several tests applying different thresholds, (2) the designation of a cutoff, (3) the number of iterations to execute, and (4) a manual review operation of a certain amount of multi-categorized journals. Despite certain shortcomings related with journal classification, the method showed a solid performance in grouping journals at a level higher than categories-that is, aggregating journals into subject areas. It also enabled us to redesign the SJR classification scheme, providing for a more cohesive one that covers a good proportion of re-categorized journals.

Keywords: Analysis, Citation, Development, Journal, Journal Classification, Journals, Multidisciplinary Databases, Reference Analysis, Review, Science, Scimago, Scimago Journal & Country Rank, Scopus, SJR, Subject Categorization

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Full Text: [2011\Scientometrics89, 759.pdf](2011/Scientometrics89,%20759.pdf)

Abstract: In this article, we propose mapping and visualizing the core of scientific domains using social network analysis techniques derived from mathematical graph theory. In particular, the concept of Network of the Core is introduced which can be employed to visualize scientific domains by constructing a network among theoretical constructs, models, and concepts. A Network of the Core can be used to reveal hidden properties and structures of a research domain such as connectedness, centrality, density, structural equivalence, and cohesion, by modeling the casual relationship among theoretical constructs. Network of the Core concept can be used to explore the strengths and limitations of a research domain, and graphically and mathematically derive the number research hypotheses. the Network of the Core approach can be applied to any domain given that the investigator has a deep understanding of the area under consideration, a graphical or conceptual view (in the form of a network of association among the theoretical constructs and concepts) of the scientific domain can be obtained, and an underlying theory is available or can be constructed to support Network of the Core formation. Future research directions and several other issues related to the Network of the Core concept are also discussed.

Keywords: Analysis, Association, Centrality, Constructs Theories and Concepts, Graph Theory, Information System, Journals, Mapping, Model, Modeling, Network, Network of the Core, Research, Science-Citation-Index, Social, Social Network, Social Network Analysis, South-Korea, Systems, Technology, Theory, Visualization

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Full Text: [2011\Scientometrics89, 781.pdf](2011/Scientometrics89,%20781.pdf)

Abstract: Since the relationship between patents and Tobin’s q is confusing, this paper utilizes panel threshold regression model to re-examine the relationship between patent counts/sales and Tobin’s q. This study finds out patent citations/sales has a single threshold effect on the relationship between patent counts/sales and Tobin’s q in the US pharmaceutical industry. the single threshold value of patent citations/sales is 328.81, and it divides the value of patent citations/sales into two regimes: the first regime (patent citations/sale a parts per thousand broken vertical bar 328.81) and the second regime (patent citations/sale > 328.81). the results indicate that patent counts/sales positively affect Tobin’s q in the two regimes. In addition, this study demonstrates that the extent of the positive effect of patent counts/sales on Tobin’s q is different. This study verifies that patent citations/sales moderates the relationship between patent counts/sales and Tobin’s q. Once patent citations/sales is below the threshold value, the extent of the positive relationship between patent counts/sales and Tobin’s q is the most. Therefore, this study finds out that the first regime is optimal.

Keywords: Empirical-Analysis, Industry, Innovation, Intellectual Property, Least-Squares Estimator, Market Value, Model, Multiple Indicators, Nuisance Parameter, Panel Threshold Regression Model, Patent, Patent Analysis, Patent Citation, Patent Count, Pharmaceutical-Industry, Research-And-Development, Threshold Autoregressive Model, Tobin’s q, US

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Full Text: [2011\Scientometrics89, 795.pdf](2011/Scientometrics89,%20795.pdf)

Abstract: Identifying core technologies and emerging technologies is essential for formulating national technology strategies and policies for pursuing technological competitive advantage. This study presents a quantitative method for identifying core technologies and emerging technologies in the Taiwan technological innovation system. the objective was to gain an overview of technological development in the country by analyzing patent citation networks and by identifying five core technologies and emerging technologies in Taiwan based on United States Patent and Trademark Office (USPTO) patents granted to Taiwan during 1997-2008. the findings indicate the most appropriate management of technology and innovation and the best patent strategy and technology policy that the Taiwan government should pursue. Research institutes, industries and academia are also given research directions for choosing the technologies in which they should invest resources in order to strengthen the Taiwan technological innovation system and to increase its competitive advantage in global technology.

Keywords: Analysis, Citation, Citation Networks, Core Technology, Development, Emerging Technology, Industries, Innovation, Management, Network, Network Analysis, Overview, Patent, Patent Citation, Policies, Policy, Quantitative, Research, Statistics, Strategy, Taiwan, USPTO

? Messinis, G. (2011), Triadic citations, country biases and patent value: The case of pharmaceuticals. *Scientometrics*, **89** (3), 813-833.

Full Text: [2011\Scientometrics89, 813.pdf](2011/Scientometrics89,%20813.pdf)

Abstract: Triadic patents minimise home bias effects in studies that focus on patent counts as a measure of innovative activity. Yet, biases in qualitative patent indicators have been largely neglected. This article advocates that forward patent citations, and triadic citations in particular, can illuminate further on home bias, self citations, and the speed of knowledge flows for drug patents published by the USPTO for the period 1980-2008. the evidence shows that triadic citations help to minimize the home bias in citations as well as to make patent quality more transparent. Also, it indicates that self citations and the age distribution of citations are important factors to consider when explaining cross-country differences in pharmaceutical citations.

Keywords: Bias, Biases, Citations, Differences, Drug, EPO, Knowledge, Knowledge Spillovers, OECD Countries, Patent, Patents, Pharmaceuticals, Quality, Self-Citations, Triadic Citations, USPTO

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Full Text: [2011\Scientometrics89, 835.pdf](2011/Scientometrics89,%20835.pdf)

Abstract: Schubert (Scientometrics, 78:559-565, 2009) showed that “a Hirsch-type index can be used for assessing single highly cited publications by calculating the h Index of the set of papers citing the work in question” (p. 559). To demonstrate that this single publication h Index is a useful yardstick to compare the quality of different publications; the index should be strongly related to the assessment by peers. In a comprehensive research project we investigated the peer review process of the Angewandte Chemie International Edition. the data set contains manuscripts reviewed in the year 2000 and accepted by the journal or rejected but published elsewhere. Single publication h Index values were calculated for a total of 1,814 manuscripts. the results show a correlation in the expected direction between peer assessments and single publication h Index values: After publication, manuscripts with positive ratings by the journal’s reviewers show on average higher h Index values than manuscripts with negative ratings by reviewers (and later published elsewhere). However, our findings do not support Schubert’s (2009) assumption that the additional dimension of indirect citation influence contributes to a more refined picture of the most cited papers.

Keywords: Angewandte-Chemie, Assessment, Chemistry, Citation, h Index, h-Index, Highly-Cited, Journal, Journal Peer Review, Papers, Peer Review, Peer-Review, Publication, Publications, Quality, Research, Review, Scientometrics, Single Publication h Index

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Full Text: [2011\Scientometrics89, 845.pdf](2011/Scientometrics89,%20845.pdf)

Abstract: the demographical data of the National Science Foundation on research doctorate awardees in the United States is studied in this article. While the overall growth rate of research doctorate awardees is approximately the same as the growth rate of the whole population in the U.S. there are considerable changes in the sub-populations of research doctorate awardees. the demographic data is evaluated/discussed in more detail with respect to gender and research fields of the doctorate awardees. In particular the notion of the primacy of technology over science in the postmodern era is examined and found to be justified.

Keywords: Age, Demography, Education, Gender, Growth, Labor, Research, Research Doctorates, Research Fields, Science, Science, System, Technology, Trends, US

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Full Text: [2011\Scientometrics89, 867.pdf](2011/Scientometrics89,%20867.pdf)

Abstract: the increased use of e-learning techniques as an accepted form of teaching has resulted in a growing volume of academic research dedicated to their assessment. Despite the importance of the technique, there is little comprehensive knowledge on e-learning, especially in non-educational fields. Author co-citation analysis (ACA) is an analytical method for identifying the intellectual structure of specific knowledge domains through the relationship between two similar authors. ACA has been applied to many fields, such as information retrieval, knowledge management, and strategic management; however, it has not yet been used to analyze e-learning development. This study examines the intellectual structure of e-learning from the perspective of management information systems (MIS). By applying the ACA method, we analyze and categorize international and Taiwanese research topics into clusters. Our results show that Taiwanese authors put more effort into practical studies of business training, while international authors focus on a users’ psychological reaction to learning context. Altogether, our research provides a clear intellectual analysis of e-learning practices from 1996 to 2009, enabling us to thoroughly study and understand the influence of these techniques on modern education.

Keywords: Analysis, Assessment, Author, Author Co-Citation Analysis, Authors, Co-Citation Analysis, Cocitation, Development, E-Learning, Education, Information, Information Retrieval, Information Systems, Information-Retrieval, Intellectual Structure, Journals, Knowledge, Knowledge Domains, Learning, Management, Management Field, MIS, Psychological, Research, Research Topics, Science, Teaching, Topics, Training

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Full Text: [2011\Scientometrics89, 887.pdf](2011/Scientometrics89,%20887.pdf)

Abstract: the purpose of this study is to examine efficiency and its determinants in a set of higher education institutions (HEIs) from several European countries by means of non-parametric frontier techniques. Our analysis is based on a sample of 259 public HEIs from 7 European countries across the time period of 2001-2005. We conduct a two-stage DEA analysis (Simar and Wilson in J Economet 136:31-64, 2007), first evaluating DEA scores and then regressing them on potential covariates with the use of a bootstrapped truncated regression. Results indicate a considerable variability of efficiency scores within and between countries. Unit size (economies of scale), number and composition of faculties, sources of funding and gender staff composition are found to be among the crucial determinants of these units’ performance. Specifically, we found evidence that a higher share of funds from external sources and a higher number of women among academic staff improve the efficiency of the institution.

Keywords: Analysis, Australian Universities, Data Envelopment Analysis, DEA, Determinants, Education, Efficiency, Empirical-Analysis, Funding, Gender, Higher Education, Methodology, Nonparametric, Nonparametric Frontier Models, Performance, Research Output, Research Productivity, Secondary-Schools, Two-Stage DEA, UK Universities, Variability, Women

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Full Text: [2011\Scientometrics89, 919.pdf](2011/Scientometrics89,%20919.pdf)

Abstract: A keyword analysis was applied in this work to evaluate research trends of eutrophication papers published between 1991 and 2010 in any journal of all the subject categories of the Science Citation Index compiled by Institute for Scientific Information, Philadelphia, USA. Eutrophication was used as a keyword to search parts of titles, abstracts, or keywords. the published output analysis showed that eutrophication research steadily increased over the past 20 years and the annual publication output in 2008, 2009, 2010 were about four times that of 1991. the whole paper published by China ranked at 3rd, but these papers’ IF were lower than the average of the world. “Water Framework Directive” and “Life Cycle Assessment” were two of the most frequently used author keywords in the period between 1999 and 2010 whilst they did not appear before 1998. These new conception indicated eutrophication research trend was changing to policy and management from technological researches.

Keywords: Analysis, Author, Bibliometric, Bibliometric Study, China, Citation, Eutrophication, Journal, Life Cycle Assessment, Management, Nitrogen, Papers, Phosphorus, Policy, Pollution, Publication, Publication Output, Research, Research Trend, Research Trends, SCI, Science, Science Citation Index, Scientific Information, Trend, Trends, USA, Water, Water Framework Directive

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Full Text: [2011\Scientometrics89, 929.pdf](2011/Scientometrics89,%20929.pdf)

Abstract: Development of bibliometric techniques has reached such a level as to suggest their integration or total substitution for classic peer review in the national research assessment exercises, as far as the hard sciences are concerned. In this work we compare rankings lists of universities captured by the first Italian evaluation exercise, through peer review, with the results of bibliometric simulations. the comparison shows the great differences between peer review and bibliometric rankings for excellence and productivity.

Keywords: Assessment, Bibliometric, Bibliometrics, Differences, Evaluation, Exercise, Exercises, Indicators, Italy, Peer Review, Peer-Review, Productivity, Rankings, Research, Research Assessment, Research Productivity, Review, Sciences, Universities, University

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Full Text: [2011\Scientometrics89, 943.pdf](2011/Scientometrics89,%20943.pdf)

Abstract: We have developed a set of routines that allows to draw easily different maps of the research carried out in a scientific institution. Our toolkit uses OpenSource elements to analyze bibliometric data gathered from the Web of Science. We take the example of our institution, ENS de Lyon, to show how different maps, using co-occurrence (of authors, keywords, institutionsaEuro broken vertical bar) and bibliographic coupling can be built. These maps may become a valuable tool for discussing institutions’ policies, as they offer different views on the institution at a global scale.

Keywords: Authors, Bibliographic, Bibliographic Coupling, Bibliometric, Governance, Heterogeneous, Institutions, Map, Maps, Policies, Research, Science, Scientific Institutions

? Slyder, J.B., Stein, B.R., Sams, B.S., Walker, D.M., Beale, B.J., Feldhaus, J.J. and Copenheaver, C.A. (2011), Citation pattern and lifespan: A comparison of discipline, institution, and individual. *Scientometrics*, **89** (3), 955-966.

Full Text: [2011\Scientometrics89, 955.pdf](2011/Scientometrics89,%20955.pdf)

Abstract: Citation frequency is often used in hiring and tenure decisions as an indicator of the quality of a researcher’s publications. In this paper, we examine the influence of discipline, institution, journal impact factor, length of article, number of authors, seniority of author, and gender on citation rate of top-cited papers for academic faculty in geography and forestry departments. Self-citation practices and patterns of citation frequency across post-publication lifespan were also examined. Citation rates of the most-highly cited paper for all tenured forestry (N = 122) and geography (N = 91) faculty at Auburn University, Michigan State University, Northern Arizona University, Oklahoma State University, Pennsylvania State University, Texas A&M University, University of Florida, University of Massachusetts, University of Washington, and Virginia Tech were compared. Foresters received significantly more citations than geographers (t = 2.46, P = 0.02) and more senior authors received more citations than junior researchers (r (2) = 0.14, P = 0.03). Articles published in journals with higher impact factors also received more citations (r (2) = 0.28, P = 0.00). the median self-citation rate was 10% and there was no temporal pattern to the frequency of citations received by an individual article (x (2) = 176). Our results stress the importance of only comparing citation rates within a given discipline and confirm the importance of author-seniority and journal rankings as factors that influence citation rate of a given article.

Keywords: Article Length, Articles, Author, Author Seniority, Authors, Citation, Citation Biases, Citation Rates, Citations, Co-Authorship, Faculty, Frequency, Gender, Gender-Differences, Hiring, Impact, Impact Factor, Impact Factors, Journal, Journal Impact, Journal Impact Factor, Journal Rankings, Journals, Librarianship, Lifespan, Papers, Productivity, Publication, Publications, Quality, Rankings, Researchers, Scientists, Self-Citation, Sex-Differences, Stress, Trends, University

? Jeong, S., Choi, J.Y. and Kim, J. (2011), the determinants of research collaboration modes: Exploring the effects of research and researcher characteristics on co-authorship. *Scientometrics*, **89** (3), 967-983.

Full Text: [2011\Scientometrics89, 967.pdf](2011/Scientometrics89,%20967.pdf)

Abstract: Given the high priority accorded to research collaboration on the assumption that it yields higher productivity and impact rates than do non-collaborative results, research collaboration modes are assessed for their benefits and costs before being executed. Researchers are accountable for selecting their collaboration modes, a decision made through strategic decision making influenced by their environments and the trade-offs among alternatives. In this context, by using bibliographic information and related internal data from the Korea Institute of Machinery and Materials (KIMM, a representative Korean government institute of mechanical research), this paper examines the suggested yet unproven determinants of research collaboration modes that the SCI data set cannot reveal through a Multinomial Probit Model. the results indicate that informal communication, cultural proximity, academic excellence, external fund inspiration, and technology development levels play significant roles in the determination of specific collaboration modes, such as sole research, internal collaboration, domestic collaboration, and international collaboration. This paper refines collaboration mode studies by describing the actual collaboration phenomenon as it occurs in research institutes and the motivations prompting research collaboration, allowing research mangers to encourage researchers to collaborate in an appropriate decision-making context.

Keywords: Bibliographic, Citations, Co-Authorship, Coauthorship, Collaboration, Communication, Costs, Decision Making, Decision-Making, Determinants, Development, Domestic Collaboration, Economics, Impact, Information, International Collaboration, Model, Multinomial Probit Model, Multinomial Probit Model, Organization, Productivity, Research, Research and Development Strategy, Research Collaboration, Researchers, Rewards, SCI, Science, Scientists Collaboration

? Khan, G.F. and Park, H.W. (2012), Editorial: Triple Helix and innovation in Asia using scientometrics, webometrics, and informetrics. *Scientometrics*, **90** (1), 1-7.

Full Text: [2012\Scientometrics90, 1.pdf](2012/Scientometrics90,%201.pdf)

Abstract: There is a burgeoning interest among academic scientists and policy-makers in the development and employment of TH (Triple Helix) and WSI (Webometrics, Scientometrics, and Informetrics) research methods. However, the international literature has not systematically examined TH and WSI approaches in an Asian context. Furthermore, previous literature published in international journals does not adequately address the social forces shaping TH development in Asia. Therefore, the purpose of this special issue is to bring researchers together to discuss university-industry-government (U-I-G) relations and innovation diffusion in Asia employing WSI alongside other methods.

Keywords: Asia, Development, Diffusion, Dynamics, Employment, Industry-Government Relations, Informetrics, Innovation, Interest, Journals, Literature, Research, Researchers, Scientometrics, Social, Triple Helix, University-Industry-Government Relations, Webometrics

? Cho, S.E. and Park, H.W. (2012), Government organizations’ innovative use of the Internet: The case of the Twitter activity of South Korea’s Ministry for Food, Agriculture, Forestry and Fisheries. *Scientometrics*, **90** (1), 9-23.

Full Text: [2012\Scientometrics90, 9.pdf](2012/Scientometrics90,%209.pdf)

Abstract: Noting the government’s role in diffusing information across various sectors of society, this study analyzes the Twitter activity of the Ministry for Food, Agriculture, Forestry and Fisheries (MFAFF), one of Korea’s government organizations. From a broad perspective, this study provides a better understanding of innovation activity mediated by social media-particularly the government’s Twitter activity, a topic that has not been addressed by previous webometric research on Triple Helix relationships-by employing social network analysis and content analysis. The results indicate some limitations of the MFAFF’s activity on Twitter as a mutual communication channel, although Twitter has the potential to facilitate risk management. Further, based on the MFAFF’s confined use of its Twitter account, the results suggest that its Twitter account can be an effective information distribution channel, indicating Twitter’s value as a communication tool for innovation activity through social media. This study provides an empirical analysis of the government’s Twitter activity and contributes to the literature by providing an in-depth understanding of the Triple Helix relationship on the Web.

Keywords: Agriculture, Analysis, Communication, Content Analysis, Government, Information, Innovation, Innovative, Internet, Literature, Management, Network, Network Analysis, Policy Promotion, Research, Risk, Semantic Network Analysis, Social, Social Network, Social Network Analysis, Twitter, Web

? Choi, S. (2012), Core-periphery, new clusters, or rising stars? International scientific collaboration among ‘advanced’ countries in the era of globalization. *Scientometrics*, **90** (1), 25-41.

Full Text: [2012\Scientometrics90, 25.pdf](2012/Scientometrics90,%2025.pdf)

Abstract: Assuming the OECD member states as ‘advanced’ nations equipped with basic scientific capacities, the present research addresses the network configuration of these countries in international scientific collaboration and the transformation of this network along with globalization. The result suggests that geographical, linguistic, and economic affinities did not have a meaningful impact on the formation of co-authorship network between ‘advanced’ nations, different from previous research results which claimed their importance on international cooperation. Globalization facilitated by the development of information and transportation technologies was found to influence the co-authorship link between countries, but not to accelerate centralization of the network in the past 15 years. Though the core-periphery pattern still persists, new rising stars, which are Korea and Turkey, have emerged in the co-authorship network among ‘advanced’ nations. These two countries, having a rapid increase in the share of degree centrality from 1995 to 2010, had strategic financial support from the government which stimulated the collaboration between universities and industries and emphasized the development of science and engineering fields.

Keywords: Centrality, Co-Authorship, Co-Authorship Network, Coauthorship, Collaboration, Cooperation, Development, Financial Support, Globalization, Government-University-Industry, Impact, Industries, Information, Innovation, International Scientific Collaboration, Knowledge, Korea, Korea, Network, OECD, Patterns, Reflections, Research, Science, Scientific Collaboration, Technology, Transportation, Triple-Helix, Turkey, Universities

? Choi, S., Park, J.Y. and Park, H.W. (2012), Using social media data to explore communication processes within South Korean online innovation communities. *Scientometrics*, **90** (1), 43-56.

Full Text: [2012\Scientometrics90, 43.pdf](2012/Scientometrics90,%2043.pdf)

Abstract: In order to explore new scientific and innovative communities, analyses based on a technological infrastructure and its related tools, for example, ‘Web of science’ database for Scientometric analysis, are necessary. However, there is little systematic documentation of social media data and webometric analysis in relation to Korean and broader Asian innovation communities. In this short communication, we present (1) webometric techniques to identify communication processes on the Internet, such as social media data collection and analysis using an API-based application; and (2) experimentation with new types of data visualization using NodeXL, such as social and semantic network analysis. Our research data is drawn from the social networking site, Twitter. We also examine the overlap between innovation communities in terms of their shared members, and then, (3) calculate entropy values for trilateral relationships.

Keywords: Analysis, Communication, Data Collection, Documentation, Indicators, Innovation, Internet, Network, Network Analysis, Research, Science, Social, Social Media, Systematic, Twitter, Visualization, Web of Science, Webometrics

? Hossain, M.D., Moon, J., Kang, H.G., Lee, S.C. and Choe, Y.C. (2012), Mapping the dynamics of knowledge base of innovations of R&D in Bangladesh: Triple helix perspective. *Scientometrics*, **90** (1), 57-83.

Full Text: [2012\Scientometrics90, 57.pdf](2012/Scientometrics90,%2057.pdf)

Abstract: Triple helix (TH) collaborations involving university, industry and government provide a networked infrastructure for shaping the dynamic fluxes of knowledge base of innovations locally and these fluxes remain emergent within the domains. This study maps these emergence dynamics of the knowledge base of innovations of Research & Development (R&D) by exploring the longitudinal trend of systemness within the networked research relations in Bangladesh on the TH model. The bibliometric data of publications collected from the Science Citation Index (SCI), the social sciences and the arts and humanities for analysis of science indicators and the patent data collected from the US Patent Office to analyze the patent success ratio as a measure of innovation within TH domains. The findings show that the network dynamics have varied considerably according to the R&D policies of the government. The collaboration patterns of co-authorship relations in the SCI publications prominently increased, with some variation, from 1996 to 2006. Nevertheless, inter-institutional collaboration negatively influenced by the national science and technology (S&T) research policies in the last 5 years due to their evaluation criteria. Finally, the findings reveal that the R&D system of Bangladesh is still undergoing a process of institutionalizing S&T and has failed to boost its research capacity for building the knowledge base of innovations by neglecting the network effects of TH dynamics.

Keywords: Analysis, Bangladesh, Bangladesh Government, Bibliometric, Capacity, Citation, Co-Authorship, Coauthorship, Collaboration, Collaborations, Evaluation, Indicators, Industry, Innovation, Innovations, Knowledge, Korea, Model, Network, Patent, Policies, Process, Publications, Ratio, Research, Research & Development, Research Capacity, SCI, Science, Science And Technology, Science Citation Index, Sciences, Social, Social Sciences, Success, Systems, Terms, Trend, Triple Helix, University, University-Industry-Government, US

? Khan, G.F., Cho, S.E. and Park, H.W. (2012), A comparison of the Daegu and Edinburgh musical industries: A triple helix approach. *Scientometrics*, **90** (1), 85-99.

Full Text: [2012\Scientometrics90, 85.pdf](2012/Scientometrics90,%2085.pdf)

Abstract: The Triple Helix (TH) model and its indicators are typically used for exploring university-industry-government relations prevalent in knowledge-based economies. However, this exploratory study extends the TH model, together with webometric analysis, to the musical industry to explore the performance of social hubs from the perspective of entropy and the Web. The study investigates and compares two social hubs-Daegu and Edinburgh-from the perspective of musicals by using data obtained through two search engines (Naver.com and Bing.com). The results indicate that although Daegu is somewhat integrated into the local musical industry, it is not yet fully embedded in the international musical industry, even though it is international in scope. In terms of social events (i.e., musicals), unlike Daegu, Edinburgh is fully integrated into both the local and international musical industries and attracts diverse domains over the Internet.

Keywords: Analysis, Daegu, Edinburgh, Indicators, Industries, Industry, Internet, Model, Musical, Social, Social Event, Triple Helix Model

? Kim, H., Huang, M., Jin, F., Bodoff, D., Moon, J. and Choe, Y.C. (2012), Triple helix in the agricultural sector of Northeast Asian countries: A comparative study between Korea and China. *Scientometrics*, **90** (1), 101-120.

Full Text: [2012\Scientometrics90, 101.pdf](2012/Scientometrics90,%20101.pdf)

Abstract: In this paper, the agricultural innovation systems of two Northeast Asian countries-Korea and China-are investigated and compared from the perspective of triple helix innovation. Specifically, the current study examines the nature of agricultural innovation of the two countries and considers agricultural R&D investments and activities as well as the roles of university, industry, and government (UIG), which are the three units comprising the triple helix. As an empirical extension of the qualitative analysis, we collected bibliometric information of agricultural scientific publications from 1990 to 2010 and patent information from 1980 to 2010. By calculating transmission of uncertainty, which indicates collaboration among UIG, this paper tracks the relationship dynamics of the units comprising the triple helix. In addition, we analyze topics in scientific publications and patents in order to observe and compare the subareas that are the focus in the two countries. The findings reveal both commonalities and differences between the two countries, thus providing knowledge of and insights into the agricultural sector.

Keywords: Activities, Agricultural Sector, Analysis, As, Bibliometric, China, Collaboration, Comparative Study, Differences, Entropy, Industry, Information, Innovation, Innovation Systems, Knowledge, Korea, Model, Patent, Publications, Qualitative, R&D, Scientific Publications, South-Korea, Technology, Topics, Triple Helix, University, University-Industry-Government

? Kim, M. and Park, H.W. (2012), Measuring Twitter-based political participation and deliberation in the South Korean context by using social network and Triple Helix indicators. *Scientometrics*, **90** (1), 121-140.

Full Text: [2012\Scientometrics90, 121.pdf](2012/Scientometrics90,%20121.pdf)

Abstract: This study investigates the role of Twitter in political deliberation and participation by analyzing the ways in which South Korean politicians use Twitter. In addition, the study examines the rise of Twitter as user-generated communication system for political participation and deliberation by using the Triple Helix indicators. For this, we considered five prominent politicians, each belonging to one of four political parties, by using data collected in June 2010. The results suggest that non-mainstream, resource-deficient politicians are more likely to take advantage of Twitter’s potential as an alternative means of political participation and that a small number of Twitter users lead political discourse in the Twittersphere. We also examined the occurrence and co-occurrence of politicians’ names in Twitter posts, and then calculate entropy values for trilateral relationships. The results suggest that the level of political deliberation, expressed in terms of the level of balance in the communication system, is higher when politicians with different political orientations form the trilateral relationships.

Keywords: Alternative, Balance, Communication, Indicators, Korea, Lead, Network, Participation, Polarization, Politician, Revolution, Social, Social Network, Triple Helix, Twitter, Web

? Kondo, M. (2012), A public research institute that created and led a large industrial group in Japan. *Scientometrics*, **90** (1), 141-162.

Full Text: [2012\Scientometrics90, 141.pdf](2012/Scientometrics90,%20141.pdf)

Abstract: The importance of domestic technology transfer from the public sector (universities and public research institutes) to industry is increasing in the era of science-driven innovation. One of the purposes of a triple helix of evolving university-government-industry relations is how to make use of universities and public research institutes for industrial development. This paper first discusses the means of domestic technology transfer and points out that spinning off companies is one ultimate way to transfer technology, after discussing the relation between a triple helix and technology transfer. Then, this paper presents a unique case of a public research institute before the end of World War II in Japan. This research institute established 63 companies, such as Ricoh and Okamoto. At the same time the institute excelled in science as well. The first two Nobel Prize Laureates of Japan were researchers of this research institute. The paper discusses the management of this institute and its group companies and enabling environment surrounding the institute and its group companies at that time. At the end, the paper draws some lessons for public research institutes and their spin-off companies today.

Keywords: Development, Environment, Industry, Industry Groups, Innovation, Japan, Management, Nobel Prize, Performance, Points, Public Research, Public Research Institutes, Research, Researchers, Science, Spin-Offs, Technology, Technology Transfer, Triple Helix, Universities

? Kwon, K.S., Park, H.W., So, M. and Leydesdorff, L. (2012), Has globalization strengthened South Korea’s national research system? National and international dynamics of the Triple Helix of scientific co-authorship relationships in South Korea. *Scientometrics*, **90** (1), 163-176.

Full Text: [2012\Scientometrics90, 163.pdf](2012/Scientometrics90,%20163.pdf)

Abstract: We trace the structural patterns of co-authorship between Korean researchers at three institutional types (university, government, and industry) and their international partners in terms of the mutual information generated in these relations. Data were collected from the Web of Science during the period 1968-2009. The traditional Triple-Helix indicator was modified to measure the evolving network of co-authorship relations. The results show that international co-authorship relations have varied considerably over time and with changes in government policies, but most relations have become stable since the early 2000s. In other words, the national publication system of Korea has gained some synergy from R&D internationalization during the 1990s, but the development seems to stagnate particularly at the national level: whereas both university and industrial collaborations are internationalized, the cross-connection within Korea has steadily eroded.

Keywords: Co-Authorship, Coauthorship, Collaborations, Development, Globalization, Impact, Industry, Information, Innovation, Innovation, International Collaboration, Korea, Modified, Mutual Information, National Research System, Network, Networks, Policies, Productivity, Publication, Quality, R&D, R&D Internationalization, Research, Research Collaboration, Researchers, Science, Self-Organization, South Korea, Traditional, Triple Helix, University, University-Industry-Government, University-Industry-Government Relationship, Web of Science

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Full Text: [2012\Scientometrics90, 177.pdf](2012/Scientometrics90,%20177.pdf)

Abstract: What factors influence the relationship between the academic research and the knowledge- transfer activities of academics, in particular in ‘catch-up’ countries like South Korea? To address this research question, after first conducting a critical review of existing theoretical and empirical studies, we put forward a conceptual framework based on the twin concepts of ‘synergy’ and ‘separation’ modes, together with a number of accompanying hypotheses. These hypotheses, along with others that emerged from subsequent interviews, are then tested using various statistical models. After taking into account the specific characteristics of scientific communities in rapidly catching-up counties such as Korea, we find that not only are individual characteristics (such as the gender, age, discipline, and patenting activity) of academics significantly related to the generation of a ‘synergy mode’ (i.e. a positive relationship between academic research and knowledge-transfer activities) among academics, but so too are a number of contextual characteristics (e.g. laboratory size and type of university).

Keywords: Academics, Activities, Entrepreneurial, Exploration, Gender, Industry, Innovation Systems, Knowledge, Knowledge Transfer, Korea, Performance, Productivity, Research, Review, Science, Scientists, Separation, South Korea, South-Korea, Statistical, Synergy, Synergy And Separation Modes, Third Mission, Universities, University, University-Research

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Full Text: [2012\Scientometrics90, 201.pdf](2012/Scientometrics90,%20201.pdf)

Abstract: With the rapid development of the Internet, there is a need for evaluating the public visibility of universities on the Internet (i.e., web visibility) in terms of its implications for university management, planning, and governance. The data were collected in December 2010 by using Yahoo, one of the most widely used search engines. Specifically, we gathered “Single Mention” data to measure the number of times that each university was mentioned on websites. In addition, we collected network-based data on Single Mentions. We obtained another data set based on the 2010 world university rankings by Shanghai Jiao Tong University (SJTU). We employed several analytical methods for the analysis, including correlations, nonparametric tests (e.g., the Mann-Whitney test), and multidimensional scaling (MDS). The significant positive correlation between university rankings and web visibility suggests that indicators of web visibility can function as a proxy measure of conventional university rankings. Another distinctive implication can be drawn from the pattern of a disparity in web visibility stemming from the linguistic divide, that is, universities in English-speaking countries dominated the central positions in various network structures of web visibility, whereas those in non-English-speaking countries were located in the periphery of these structures. In this regard, further research linking web visibility to university management, planning, and governance is needed.

Keywords: Academic Web, Analysis, Departments, Development, Disparity, Indicators, Inlinks, Internet, Management, Network, Nonparametric, Patterns, Rankings, Research, Site Interlinking, Telecommunications Network, Universities, University, Visibility, Web Visibility, Webometrics, Websites, World University Rankings

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Full Text: [2012\Scientometrics90, 219.pdf](2012/Scientometrics90,%20219.pdf)

Abstract: The era of open and sustainable innovation has opened and requested new kinds of human resources (HRs) development at Korean universities. Typical academic and vocational education at universities does not effectively work in the age of technological convergence and open innovation. Knowledge and skills for Green growth and rapid technological innovation demand very skilful, broad, and complex competencies of HRs. Competencies for green growth and disruptive innovation are outlined and various methods to increase competencies at Korean universities are suggested in this study. This study explores the kinds of competencies for future society and suggests how university can contribute to cultivate talents for HRs with multi-functional and high competencies. The author takes a sketch of competence and skill structure in Korea, summarized in value chain of competencies among HRs with high competencies, HRs with medium competencies, and HRs with low competencies. Particularly the author addresses innovation oriented fields such as engineering and chemistry/pharmaceuticals, therefore, the picture can be different from typical manufacturing sectors such as automobile and shipbuilding. However, the manufacturing fields are also progressing into innovation centred sectors. And then the author explores the flow of each HRs according to levels and fields and how they affect Korean innovation system.

Keywords: Academic Education, Author, Collaboration, Competencies, Competency, Development, Education, Firms, Growth, Human, Human Resources Circulation, Industry-Government Relations, Innovation, Innovation System, Issue, Knowledge, Korea, Korean Universities, Low, Model, Performance, Skills, Systems, Technological Innovation, Triple-Helix, Universities, University, Us Patents, Value Chain, Vocational, Vocational Education

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Full Text: [2012\Scientometrics90, 231.pdf](2012/Scientometrics90,%20231.pdf)

Abstract: China’s economy and technology have experienced spectacular growth since the Opening-up Policy adopted in 1978. In order to explore the innovation process and development of China, this study examines the inventive activities and the collaboration pattern of university, industry and government (UIG) in China. This study analyzes the Chinese patent data retrieved from the United States Patent and Trademark Office. Three models of UIG relations which represent different triple helix configurations are introduced. According to the property of patent assignee, patent ownership can be divided into three types: individuals, enterprises, and universities and research institutes. Furthermore, enterprises can be classified into state-owned enterprise (SOE), private-owned enterprise (POE) and foreign enterprise (FE). The corresponding relationship of patent ownership with UIG is set up. Through analyzing the issued year, it is found that the inventive activities of China have experienced three developmental phases and have been promoted quickly in recent years. The achievement of innovation activities in China primarily falls on the enterprise, especially FEs and POEs. The innovation strengths of the three development phases have shifted from government to university and research institute and then industry. According to co-patent analysis, it is found that the collaboration between university and industry is the strongest and has been intensified in recent years, but other forms of collaboration among UIG have been weak. In addition, an innovation relation model of China was set up. The evolution process of innovation systems was explored, from etatistic model, followed by improved “laissez-faire” model, and then shifting toward triple helix model.

Keywords: Achievement, Activities, Analysis, China, Collaboration, Development, Evolution, Falls, Fe, Firms, Growth, Industry, Innovation, Model, Patent, Patent Analysis, Policy, Process, Research, Triple Helix, Triple-Helix, United States, Universities, University, University-Industry-Government

? Liang, L.M., Chen, L.X., Wu, Y.S. and Yuan, J.P. (2012), The role of Chinese universities in enterprise-university research collaboration. *Scientometrics*, **90** (1), 253-269.

Full Text: [2012\Scientometrics90, 253.pdf](2012/Scientometrics90,%20253.pdf)

Abstract: In this paper the role of Chinese universities in enterprise-university research collaboration is investigated. This study focuses on a special aspect of the collaboration-co-authored articles. The two cases are analyzed: (1) research collaboration between Baosteel Group Corporation and Chinese universities; (2) research collaboration between China Petroleum & Chemical Corporation and Chinese universities. The co-authorship data over the period 1998-2007 were searched from CNKI database, the largest Chinese publication and citation database. The main findings are as follows: the number of articles co-authored by enterprise and university scientists has been increasing rapidly; the share of co-authored articles has been growing; the authors from universities are more possible to be the first authors; as a whole, enterprise-university co-authored articles tend to receive more citations and get downloaded more frequently; a mathematical orientation emerges in the enterprise-university articles. To reveal and describe such a trend the methods of keywords analysis and co-occurrence analysis are applied. The Chinese government’s policy instruments and substantial supports for pushing and improving enterprise-university research collaboration are introduced and analyzed.

Keywords: Age Structures, Analysis, Authors, China, Chinese Universities, Citation, Citations, Co-Authored Articles, Co-Authorship, Coauthorship, Collaboration, Collnet, Enterprise-University Research Collaboration, Government, Industry, Mathematical Orientation, Network, Patterns, Policy, Publication, Publications, Research, Research Collaboration, Scientific Collaboration, Trend, Triple-Helix, Universities, University

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Full Text: [2012\Scientometrics90, 271.pdf](2012/Scientometrics90,%20271.pdf)

Abstract: This paper provides a first-ever look at differences of centrality scores (i.e., networks) over time and across research specializations in Korea. This is a much needed development, given the variance which is effectively ignored when Science Citation Index (SCI) publications are aggregated. Three quantitative tests are provided-OLS, two sample t-tests, and unit-root tests-to establish the patterns of centrality scores across Korea over time. The unit-root test is particularly important, as it helps identify patterns of convergence in each region’s centrality scores. For all other geographic regions besides Seoul, Gyeonggi, and Daejeon, there appears to be little promise-at least in the immediate future-of being network hubs. For these top three regions, though, there is a pattern of convergence in three-quarters of all research specializations, which we attribute in part to policies in the mid- and late-1990s.

Keywords: Centrality, China, Citation, Collaboration, Convergence, Density, Development, Differences, Fragmentation, Innovation Systems, Korea, Korean NIS, Network, Network Analysis, Policies, Publications, Quantitative, Regional Development, Research, SCI, Science, Science Citation Index, South Korea, Tests

? Shapiro, M.A. (2012), Receiving information at Korean and Taiwanese universities, industry, and GRIs. *Scientometrics*, **90** (1), 289-309.

Full Text: [2012\Scientometrics90, 289.pdf](2012/Scientometrics90,%20289.pdf)

Abstract: This article examines the incentive structure underlying information transfers received by the three key players of the Triple Helix paradigm: universities, industry, and government research institutes (GRIs). For Korea and Taiwan, which are the cases under analysis here, such an empirical examination has not yet been conducted on a quantitative level. Using a unique dataset of survey responses from a maximum of 325 researchers based in Korean and Taiwanese universities, industry, and GRIs, this article shows that there are some significant differences between and within countries. Most importantly, policy interventions to promote university-industry-GRI interactions impact the degree to which specific information transfers are considered useful. In Korea, formal transfers are emphasized, while both formal and, in particular, informal transfers are emphasized in Taiwan.

Keywords: Analysis, Differences, East Asian Developmental State, Government Relations, Impact, Industry, Information, Information Flows, Information Transfer, Innovation, Interventions, Korea, Organization, Partnerships, Performance, Policy, Public Research, Quantitative, R&D Collaboration, Research, Research-and-Development, Researchers, Science, South-Korea, Survey, Taiwan, Technology Spillovers, Triple Helix, Triple Helix Relations, Triple-Helix, Universities

? Shin, J.C., Lee, S.J. and Kim, Y. (2012), Knowledge-based innovation and collaboration: A triple-helix approach in Saudi Arabia. *Scientometrics*, **90** (1), 311-326.

Full Text: [2012\Scientometrics90, 311.pdf](2012/Scientometrics90,%20311.pdf)

Abstract: This study analyzed the research productivity of Saudi academics using the triple-helix model. In the analysis, we combined domestic and international collaboration by three sectors-university, industry, and government-according to the model of the triple-helix. This approach produces better results than by simply including international collaboration as fourth sector. According to the analysis, research collaboration in Saudi Arabia which is measured by the triple-helix, was “-” uncertainty (negative T-value) while scientific productivity has been dramatically increasing since the late 2000s. The triple-helix collaboration does not quite differ between domestic collaboration and “domestic and international” collaborations. In our further analysis, we found that technological development was not based on scientific research in Saudi Arabia; rather, the technological development relies on prior technology (patent references). From that point, Saudi Arabia’s current long-term strategic plan to develop a scientific base for a knowledge-based industry is well aligned to the current contexts of Saudi Arabia.

Keywords: Academic Research, Academics, Analysis, Collaboration, Collaborations, Development, Domestic Collaboration, Industry, Innovation, International Collaboration, Japan, Knowledge-Based Innovation, Linkages, Model, Patent, Productivity, Publication, Research, Research Collaboration, Research Productivity, Saudi Arabia, Science, Science Intensity, Scientific Productivity, Scientific Research, South-Korea, Technology Interactions, Triple-Helix, Universities

? Vanderelst, D., Speybroeck, S. and Speybroeck, N. (2012), The perceived impact of publications on Neglected Tropical Zoonoses as measured by their impact factor. *Scientometrics*, **90** (2), 331-342.

Full Text: [2012\Scientometrics90, 331.pdf](2012/Scientometrics90,%20331.pdf)

Abstract: We investigated whether papers on Neglected Tropical Zoonoses are published in journals with lower impact factors than research on diseases with a similar global health burden. We found that, despite being cited equally often, the papers on Neglected Tropical Zoonoses were published in journals with lower impact factors. The scopes of these journals are mainly restricted to Tropical medicine. A clustering analysis revealed that The Lancet, a high impact general medical journal, does pay attention to Neglected Tropical Zoonoses. We discuss our findings in the context of the ongoing discussion about the publishing policies of medical journals. Moreover, our findings stress the importance of recent suggestions that impact factors should not be used for assigning public funding to research (programs) on Neglected Tropical Zoonoses.

Keywords: Analysis, Attention, Behavior, Burden, Burden of Disease, Clustering, Daly, Diseases, Editors, Funding, Health, Impact, Impact Factor, Impact Factors, Journal, Journals, Medical, Medical Journals, Medicine, Neglected Tropical Diseases, Neglected Tropical Zoonoses, Papers, Policies, Publications, Publishing, Quality, Research, Stress, Trends

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Full Text: [2012\Scientometrics90, 343.pdf](2012/Scientometrics90,%20343.pdf)

Abstract: This paper attempts to identify the relationship between co-authorship and the currency of the references and author self-citations in the key journals of environmental engineering. The results show that the self-citation rate of co-authored articles is higher than in single-authored articles. A statistically significant correlation is identified between the numbers of co-authors, the rate of author self-citing and the author self-cited; though it was a low correlation. The value of coefficient correlation between the number of co-authors and the author self-citing rate is slightly higher than that between the number of co-authors and the author self-cited rate, which indicates that the number of co-authors hold a stronger correlation with the self-citing rate than the self-cited rate. Meanwhile, self-citing references are found to be more up-to-date than references to others. The range of publication years of self-citing references is smaller than that of references to others, indicating that researchers tend to preferentially cite their own recent works. There is no significant difference in the latest references between self-citing references and the references to others. It might result from electronic journals that provide an easy access to the most current publications.

Keywords: Articles, Author, Author Self-Citation, Co-Authorship, Coauthorship, Environmental, Impact, Indicators, Journals, Low, Patterns, Publication, Publication Lag, Publications, Researchers, Scientific Collaboration, Self-Citation

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Full Text: [2012\Scientometrics90, 361.pdf](2012/Scientometrics90,%20361.pdf)

Abstract: This paper identifies the main references, authors and journals influencing the sustainable development literature. The task is accomplished by means of a citation analysis based on the records of ISI Web of Science. We found that the core of sustainability thinking is framed by a pattern of landmark studies published around every 5 years. Only 380 publications have been cited at least ten times. References with the highest influence are those with a global dimension and large diffusion, such as Brundtland Commission’s “Our common future” (1987) and classics such as Meadows’ et al. “Limits to growth” (1972). The list of the most influential references over the period 1960-2005 is dominated by contributions from economics (particularly ecological economics) and environmental science, but includes many other disciplines such as urban planning, political sciences and sociology. References are also made to policy documents such as “Agenda 21”, one of the main outcomes of the Rio Summit in 1992. In analyzing citation trends, we found that classics, because of their high rates of citations per year, seem to have a more enduring and stable influence.

Keywords: Analysis, Authors, Bibliometric Assessment, Citation, Citation Analysis, Citation Trends, Citations, Classics, Development, Diffusion, Ecological Economics, Ecological Economics, Economics, Environmental, Environmental Science, Impact, ISI, ISI Web of Science, Journals, Literature, Outcomes, Policy, Publications, References, Science, Sciences, Sociology, Sustainability Science, Sustainable Development, Trends, Urban, Web of Science, Web-of-Science

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Full Text: [2012\Scientometrics90, 383.pdf](2012/Scientometrics90,%20383.pdf)

Abstract: Citations to published work are gaining increasing prominence in evaluations of the research performance of scientists. Considering the importance accorded to gender issues in South African science, it is surprising that (to our knowledge) no research has as yet ascertained the extent of sex differences in citations to the published work of scientists in this country. Our literature study shows that studies that have been conducted elsewhere tend to neglect in their analyses important gender-related and other factors, such as the sex composition of multi-authored papers and the extent of foreign co-authorship. Against this background, we illustrate the difficulties inherent in measuring the quality aspect of sex-specific research performance by means of an analysis of a dataset of articles (n = 229) that were published between 1990 and 2002 in the field of invasion ecology and in journals included in the Thomson Reuters Web of Science. Each article has at least one South African author address. The results indicate that foreign co-authorship is a better correlate of high citations than the sex of South African authors, and this is true irrespective of whether the annual citation rate or window period is used, whether or not self-citations are excluded, and whether or not the number of authors is controlled for by calculating fractional counts. The paper highlights these and other considerations that are relevant for future gender-focused bibliometric research, both in South Africa and beyond.

Keywords: Africa, American Astronomers, Analysis, Articles, Author, Authors, Bibliometric, Bibliometric Research, Bibliometrics, Citation, Citations, Co-Authorship, Coauthorship, Differences, Gender, h-Index, Impact, Invasion Ecology, Journals, Knowledge, Literature, Neglect, Papers, Psychology, Publication, Quality, Research, Research Performance, Science, Scientific Productivity, Sex, South Africa, Thomson Reuters, Thomson-Reuters, Web of Science, Web-of-Science, Women

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Full Text: [2012\Scientometrics90, 407.pdf](2012/Scientometrics90,%20407.pdf)

Abstract: We introduce an indicator to measure the diffusion of scientific research. Consistent with Stirling’s 3-factor diversity model, the diffusion score captures not only variety and balance, but also disparity among citing article cohorts. We apply it to benchmark article samples from six 1995 Web of Science subject categories (SCs) to trace trends in knowledge diffusion over time since publication. Findings indicate that, for most SCs, diffusion scores steadily increase with time. Mathematics is an outlier. We employ a typology of citation trends among benchmark SCs and correlate this with diffusion scores. We also find that self-cites do not, in most cases, significantly influence diffusion scores.

Keywords: Balance, Citation, Citation Patterns, Citation Trends, Collaborative Networks, Determinants, Diffusion, Diffusion Score, Disparity, Integration Score, Interdisciplinary, Knowledge, Knowledge Diffusion, Knowledge Diffusion, Map, Mathematics, Model, Patent Citations, Publication, Research, Science, Scientific Research, Self-Citations, Subject Category Behavior, Technology, Trends, Web of Science, Web-of-Science

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Full Text: [2012\Scientometrics90, 429.pdf](2012/Scientometrics90,%20429.pdf)

Abstract: Quantifying the relative performance of individual scholars has become an integral part of decision-making in research policy. The objective of the present study was to evaluate if the scholarship rank of Brazilian Council for Scientific and Technological Development (CNPq) researchers in Medicine is consistent with their scientific productivity. The Lattes curricula of 411 researchers (2006-2008) were included in the study. Scholarship category was the variable of interest. Other variables analyzed were: time since receiving the doctorate, teaching activity (undergraduate, master’s and doctoral students), number of articles published, and number of papers indexed by the Institute for Scientific Information (ISI) and Scopus databases. Additional performance indicators included were: citations, h-index, and m-index. There was a significant difference among scholarship categories regarding number of papers per year, considering the entire scientific career (P < 0.001) or the last 5 years (P < 0.001). There was no significant difference among scholarship categories regarding the number of citations per article in the ISI (Thomson Reuters) database (P = 0.23). There was a significant difference in h-index among scholarship categories in both databases, i.e. (P < 0.001) and Scopus (P < 0.001). Regarding the m-index, there was a significant difference among categories only in the ISI database (P = 0.012). According to our findings, a better instrument for qualitative and quantitative indicators is needed to identify researchers with outstanding scientific output.

Keywords: Articles, Bibliometric Indicators, Citations, Clinical Medicine, Databases, Decision Making, Decision-Making, Evaluation Purposes, Fields, h Index, h-Index, Health Postgraduate Programs, Health Sciences, Hirsch-Index, Indicators, Interest, ISI, ISI Database, Medicine, Papers, Performance Indicators, Policy, Productivity, Qualitative, Quantitative, Ranking, Research, Research Output, Researchers, Scholarship, Science, Scientific Information, Scientific Output, Scientific Productivity, Scientific Publication Indicators, Scientists, Scopus, Students, Teaching, Thomson Reuters, Thomson-Reuters, Undergraduate

? Yoon, J. and Kim, K. (2012), Detecting signals of new technological opportunities using semantic patent analysis and outlier detection. *Scientometrics*, **90** (2), 445-461.

Full Text: [2012\Scientometrics90, 445.pdf](2012/Scientometrics90,%20445.pdf)

Abstract: In the competitive business environment, early identification of technological opportunities is crucial for technology strategy formulation and research and development planning. There exist previous studies that identify technological directions or areas from a broad view for technological opportunities, while few studies have researched a way to detect distinctive patents that can act as new technological opportunities at the individual patent level. This paper proposes a method of detecting new technological opportunities by using subject-action-object (SAO)-based semantic patent analysis and outlier detection. SAO structures are syntactically ordered sentences that can be automatically extracted by natural language processing of patent text; they explicitly show the structural relationships among technological components in a patent, and thus encode key findings of inventions and the expertise of inventors. Therefore, the proposed method allows quantification of structural dissimilarities among patents. We use outlier detection to identify unusual or distinctive patents in a given technology area; some of these outlier patents may represent new technological opportunities. The proposed method is illustrated using patents related to organic photovoltaic cells. We expect that this method can be incorporated into the research and development process for early identification of technological opportunities.

Keywords: Analysis, Anomaly Detection, Development, Environment, Multidimensional Scaling (MDS), Natural, Outlier Detection, Patent, Patent Analysis, Patent Mining, Process, Research, Research and Development, Research and Development (R&D) Planning, Research-And-Development, Sao, Semantic Patent Similarity, Strategy, Subject-Action-Object (SAO) Structure, Technological Opportunity, Technology, Tool

? Lariviere, V. (2012), On the shoulders of students? The contribution of PhD students to the advancement of knowledge. *Scientometrics*, **90** (2), 463-481.

Full Text: [2012\Scientometrics90, 463.pdf](2012/Scientometrics90,%20463.pdf)

Abstract: Using the participation in peer reviewed publications of all doctoral students in Quebec over the 2000-2007 period, this paper provides the first large scale analysis of their research effort. It shows that PhD students contribute to about a third of the publication output of the province, with doctoral students in the natural and medical sciences being present in a higher proportion of papers published than their colleagues of the social sciences and humanities. Collaboration is an important component of this socialization: disciplines in which student collaboration is higher are also those in which doctoral students are the most involved in peer-reviewed publications. In terms of scientific impact, papers co-signed by doctorate students obtain significantly lower citation rates than other Quebec papers, except in natural sciences and engineering. Finally, this paper shows that involving doctoral students in publications is positively linked with degree completion and ulterior career in research.

Keywords: Analysis, Bibliometrics, Canada, Citation, Citations, Collaboration, Contribution, Doctorate, Gender, Humanities, Impact, Indicators, Information, Knowledge, Medical, Natural, Natural-Sciences, Papers, Participation, Peer-Reviewed Publications, Postgraduate Education, Publication, Publication Output, Publications, Quebec, Research, Sciences, Scientific Impact, Scientists, Social, Social Sciences, Social-Sciences, Students

? Wang, D.B., Zhu, D.H. and Su, X.N. (2012), Lotka phenomenon in the words’ syntactic distribution complexity. *Scientometrics*, **90** (2), 483-498.

Full Text: [2012\Scientometrics90, 483.pdf](2012/Scientometrics90,%20483.pdf)

Abstract: To better understand the distribution of words in all kinds of syntactic structures, the paper calculates the word distribution in syntactic structures of both English and Chinese. On the basis of the calculation, the article presents the definition of the words’ syntactic distribution complexity. After arranging the Chinese and English words according to their own syntactic distribution complexity, respectively, the Lotka phenomenon can be clearly attested by the results. The discovery made in the paper reveals the law of the words’ syntactic distribution in linguistic studies on one hand and the statistically proven fact that Chinese words’ syntax is much more complex than that of the English after comparing the Lotka phenomenon of both Chinese and English words’ syntactic distribution complexity on the other hand.

Keywords: English, Hand, Law, Lotka Phenomenon, Treebank, Words’ Syntactic Distribution Complexity

? Yan, E.J., Ding, Y. and Jacob, E.K. (2012), Overlaying communities and topics: An analysis on publication networks. *Scientometrics*, **90** (2), 499-513.

Full Text: [2012\Scientometrics90, 499.pdf](2012/Scientometrics90,%20499.pdf)

Abstract: Two layers of enriched information are constructed for communities: a paper-to-paper network based on shared author relations and a paper-to-paper network based on shared word relations. k-means and VOSviewer, a modularity-based clustering technique, are used to identify publication clusters in the two networks. Results show that a few research topics such as webometrics, bibliometric laws, and language processing, form their own research community; while other research topics contain different research communities, which may be caused by physical distance.

Keywords: Analysis, Author, Author Cocitation Analysis, Bibliometric, Clustering, Community, Detection, Information, Information-Science, Library, Network, Publication, Research, Research Topics, Scholarly Networks, Topic, Topics, Vosviewer, Webometrics

? Park, H., Yoon, J. and Kim, K. (2012), Identifying patent infringement using SAO based semantic technological similarities. *Scientometrics*, **90** (2), 515-529.

Full Text: [2012\Scientometrics90, 515.pdf](2012/Scientometrics90,%20515.pdf)

Abstract: Companies should investigate possible patent infringement and cope with potential risks because patent litigation may have a tremendous financial impact. An important factor to identify the possibility of patent infringement is the technological similarity among patents, so this paper considered technological similarity as a criterion for judging the possibility of infringement. Technological similarities can be measured by transforming patent documents into abstracted forms which contain specific technological key-findings and structural relationships among technological components in the invention. Although keyword-based technological similarity has been widely adopted for patent analysis related research, it is inadequate for identifying patent infringement because a keyword vector cannot reflect specific technological key-findings and structural relationships among technological components. As a remedy, this paper exploited a subject-action-object (SAO) based semantic technological similarity. An SAO structure explicitly describes the structural relationships among technological components in the patent, and the set of SAO structures is considered to be a detailed picture of the inventor’s expertise, which is the specific key-findings in the patent. Therefore, an SAO based semantic technological similarity can identify patent infringement. Semantic similarity between SAO structures is automatically measured using SAO based semantic similarity measurement method using WordNet, and the technological relationships among patents were mapped onto a 2-dimensional space using multidimensional scaling (MDS). Furthermore, a clustering algorithm is used to automatically suggest possible patent infringement cases, allowing large sets of patents to be handled with minimal effort by human experts. The proposed method will be verified by detecting real patent infringement in prostate cancer treatment technology, and we expect this method to relieve human experts’ work in identifying patent infringement.

Keywords: Analysis, As, Cancer, Clustering, Human, Impact, Litigation, Measurement, Multidimensional Scaling, Natural Language Processing, NLP, Patent, Patent Analysis, Patent Litigation, Patent Mining, Patent Risk, Prostate Cancer, Research, Research-and-Development, SAO, Subject-Action-Object, Technology, Treatment, Vector, Visualization

? Li, F., Yi, Y., Guo, X.L. and Qi, W. (2012), Performance evaluation of research universities in Mainland China, Hong Kong and Taiwan: Based on a two-dimensional approach. *Scientometrics*, **90** (2), 531-542.

Full Text: [2012\Scientometrics90, 531.pdf](2012/Scientometrics90,%20531.pdf)

Abstract: For a long time, rankings overused in evaluating Chinese universities’ research performance. The relationship between research production and research quality hasn’t been taken seriously in ranking systems. Most university rankings in China put more weight on research production rather than research quality. Recently, the developmental strategy of Chinese universities has shifted from ‘quantity’ to ‘quality’. As a result, a two-dimensional approach was developed in this article to balance ‘quantity’ and ‘quality’. The research production index and the research quality index were produced to locate research universities (RU) from Mainland China, Hong Kong (HK) and Taiwan (TW) in the two-dimensional graph. Fifty-nine RU were classified into three categories according to their locations, which indicated the relevant level of research performance. University of Hong Kong, National Taiwan University, Tsing Hua University and Peking University appeared to be leading universities in research performance. The result showed that the mainland universities were generally of higher research production and lower research quality than HK and TW universities, and proved that the merging tides of Chinese universities enlarged their research production while causing a low level of research quality as well.

Keywords: A Two-Dimensional Approach, As, Balance, China, Chinese Universities, Citation, Evaluation, Hong Kong, Impact, Index, Journals, Low, Output, Performance, Performance Evaluation, Quality, Quantity, Ranking, Rankings, Research, Research Performance, Research Production, Science, Strategy, System, Taiwan, Universities, University

? Chen, C.F., Yu, Y., Tang, Q., Chiu, K., Rao, Y., Huang, X. and Sun, K. (2012), Assessing the authority of free online scholarly information. *Scientometrics*, **90** (2), 543-560.

Full Text: [2012\Scientometrics90, 543.pdf](2012/Scientometrics90,%20543.pdf)

Abstract: Authority generally relates to expertise, recognition of official status of a source, and the reputation of the author and publisher. As the Internet has become a ubiquitous tool in modern science and scholarly research, evaluating the authority of free online scholarly information is becoming crucial. However, few empirical studies have focused on this issue. Using a modified version of Jim Kapoun’s “Five criteria for evaluating web pages” as framework, this research selected 32 keywords from eight disciplines, inputted them into three search engines (Google, Yahoo and AltaVista) and used Analytic Hierarchy Process to determine the weights. The first batches of results (web pages) from keyword searching were selected as evaluation samples (in the two search phases, the first 50 and 10 results were chosen, respectively), and a total of 3,134 samples were evaluated for authority based on the evaluation framework. The results show that the average authority value for free online scholarly information is about 3.63 (out of five), which is in the “fair” level (3 a parts per thousand currency sign Z < 4) (Z is the value assigned to each sample). About 41% of all samples collected provide more authoritative scholarly information. Different domain names, resource types, and disciplines of free online scholarly information perform differently when scored in terms of authority. In conclusion, the authority of free online scholarly information has been unsatisfactory, and needs to be improved. Furthermore, the evaluation framework and its application developed herein could be a useful instrument for librarians, researchers, students, and the public to select Internet resources.

Keywords: As, Assessment, Author, Authority, Cognitive Authority, Credibility, Criteria, Evaluation, Evaluation Tools, Free Online Scholarly Information, Health Information, Information, Internet, Modified, Quality, Recognition, Research, Researchers, Resources, Science, Students, Web Sites, World

? Zhao, Q.J. and Guan, J.C. (2012), Modeling the dynamic relation between science and technology in nanotechnology. *Scientometrics*, **90** (2), 561-579.

Full Text: [2012\Scientometrics90, 561.pdf](2012/Scientometrics90,%20561.pdf)

Abstract: Nanotechnology is a promising research domain with potential and enormous economic value. It is widely acknowledged that nanotechnology, as an emerging and rapidly evolving field with the multidisciplinary nature, is perceived as proximate fields of science and technology. This study provides a further description of the relationship between science and technology at macro-level. The core objective in this paper is to qualify and assess the dynamic associations between scientific activity and technological output. We attempt to illustrate how science and technology relate one another in the case of innovation system. In this paper, we take advantage of the simultaneous equations model to analyze the reciprocal dependence between science and technology. Previous studies about the relationship between science and technology infrequently adopt this model. Our result shows that there is no significant connection between R&D expenditures and actual practices of research in terms of publications and patents for the universities in zone 1 and 2. Our results provoke questions about whether policy-makers should appropriately reallocate scientific and technological resources and other R&D expenditures so as to obtain optimal allocation for resource and achieve maximum results with little effort for scientific research and innovation performance.

Keywords: China, Dynamic Relation, Fields of Science, Growth, Indicators, Industry, Innovation, Innovation System, Knowledge, Model, Modeling, Nanoscience, Nanotechnology, Patents, Performance, Publications, R&D, Research, Science, Science And Technology, Scientific Research, Search, Simultaneous Equations Model, Technology, Universities

? Baron, J. and Delcamp, H. (2012), The private and social value of patents in discrete and cumulative innovation. *Scientometrics*, **90** (2), 581-606.

Full Text: [2012\Scientometrics90, 581.pdf](2012/Scientometrics90,%20581.pdf)

Abstract: This article analyzes the relationship between private and social value of patents, comparing discrete and cumulative innovation. Indicators of the social value of patents are known to be less correlated with measures of private value in technological fields where innovation is more cumulative. We test whether this is because the link between private and social value is weaker, or because the indicators are less informative of the underlying concepts of value. Furthermore we analyze whether these differences between technological fields are really due to cumulativeness. We observe cumulative innovation by making use of databases of patents declared essential for technological standards. Using factor analysis and a set of patent quality indicators, we test the relevance of social value for predicting the private value of a patent measured by renewal and litigation. Whereas we establish a robust and significant link for discrete technologies; neither common factors nor any indicator of social value allows predicting the private value of essential, very cumulative patents. Nevertheless, this result cannot be generalized to whole technological classes identified as “complex” by the literature.

Keywords: Analysis, Citations, Complex Technologies, Cumulative Innovation, Databases, Differences, Factor Analysis, Factor-Analysis, Indicators, Indicators, Innovation, Literature, Patent, Patent Quality, Patent Value, Quality, Quality Indicators, Renewal, Social, Standardization, Standards

? Liu, X.Z. and Fang, H. (2012), Peer review and over-competitive research funding fostering mainstream opinion to monopoly. Part II. *Scientometrics*, **90** (2), 607-616.

Full Text: [2012\Scientometrics90, 607.pdf](2012/Scientometrics90,%20607.pdf)

Abstract: In our previous work (Scientometrics 87:293-301, 2011), a numerical model of over-competitive research funding in “peer-group-assessed-grant-based-funding-system” was proposed and the process was firstly investigated quantitatively. The simulation results show that the mainstream of a very complicated research topic could obtain monopoly supremacy with only the aid of the mechanism the model described. Here, the numbers of publications of cosmology back to 1950 are utilized to empirically test this positive feedback mechanism. The development of three main theories of cosmology, Big Bang, Steady State and Plasma Universe, are revisited. The later two, which are non-mainstream opinions, both state in their peer reviewed papers, that their theories fit the phenomena that support the standard theory. The ratios of publications of the orthodox theory, Big Bang, approximately satisfy the numeric calculating results of our model. The reason for the discrepancy between the model and actual situation is discussed. A further question about the controversy is presented.

Keywords: Cosmology, Cosmology, Creation, Curvature, Development, Evolution, Excessive Competition, Feedback, Funding, Innovation, Mainstream, Mechanism, Model, Papers, Peer Review, Peer-Review, Plasma Universe, Process, Publications, Relativity, Research, Research Funding, Review, Science, Scientometrics, Simulation, Space, Theories, Theory, World

? Eckmann, M., Rocha, A. and Wainer, J. (2012), Relationship between high-quality journals and conferences in computer vision. *Scientometrics*, **90** (2), 617-630.

Full Text: [2012\Scientometrics90, 617.pdf](2012/Scientometrics90,%20617.pdf)

Abstract: In computer science, as opposed to many other disciplines, papers published in conference and workshop proceedings count as formal publications when evaluating the scholarship of an academic. We consider the relationship between high quality journals and conferences in the computer vision (CV) subfield of computer science. We determined that 30% of papers in the top-3 CV journals base their work on top-3 conference papers by the same authors (which we call priors (See “Methods” section for the definition of a prior)). Journal papers with priors are significantly more cited than journal papers without priors. Also the priors themselves are cited more than other papers from the conferences. For a period of 3-5 years after the journal paper publication, the priors receive more citations than the follow-up journal paper. After that period, the journal paper starts receiving most of the citations. Furthermore, we found that having the prior conference paper did not make it any easier (faster) to publish in a journal. We also surveyed journal authors and based on their answers and the priors analysis, we discovered that authors seem to be divided into different groups depending on their preferred method of publication.

Keywords: Analysis, Author Survey, Authors, Bibliometrics, Citations, Computer, Computer Science, Computer Vision, Conference Proceedings, Follow-up, Journal, Journal Papers, Journals, Papers, Publication, Publications, Publishing, Quality, Scholarship, Science

? Kronegger, L., Mali, F., Ferligoj, A. and Doreian, P. (2012), Collaboration structures in Slovenian scientific communities. *Scientometrics*, **90** (2), 631-647.

Full Text: [2012\Scientometrics90, 631.pdf](2012/Scientometrics90,%20631.pdf)

Abstract: We combine two seemingly distinct perspectives regarding the modeling of network dynamics. One perspective is found in the work of physicists and mathematicians who formally introduced the small world model and the mechanism of preferential attachment. The other perspective is sociological and focuses on the process of cumulative advantage and considers the agency of individual actors in a network. We test hypotheses, based on work drawn from these perspectives, regarding the structure and dynamics of scientific collaboration networks. The data we use are for four scientific disciplines in the Slovene system of science. The results deal with the overall topology of these networks and specific processes that generate them. The two perspectives can be joined to mutual benefit. Within this combined approach, the presence of small-world structures was confirmed. However preferential attachment is far more complex than advocates of a single autonomous mechanism claim.

Keywords: Bibliometry, Co-Authorship Network, Collaboration, Cumulative Advantage, Impact, Longitudinal Network Analysis, Mechanism, Model, Modeling, Network, Networks, Preferential Attachment, Process, Processes, Science, Scientific Collaboration, Small World, Stochastic Actor Based Model

? Ma, T.C., Wang, G.F., Dong, K. and Cao, M.K. (2012), The Journal’s Integrated Impact Index: A new indicator for journal evaluation. *Scientometrics*, **90** (2), 649-658.

Full Text: [2012\Scientometrics90, 649.pdf](2012/Scientometrics90,%20649.pdf)

Abstract: Journal impact factor (JIF) has been used for journal evaluation over a long time, but also accompanied by the continuing controversy. In this study, a new indicator, the Journal’s Integrated Impact Index (JIII) has been proposed for journal evaluation. In the JIII, one journal’s average citations per paper, total citations, and all journals’ average level of average citations per paper and total citations have been used to characterize the integrated impact of journals. Some contrastive analyses were carried out between JIII and JIF. The results show some interesting properties of the new indicator, and also reveal some relevant relationships among JIII, JIF, and other bibliometric indicators.

Keywords: Bibliometric, Bibliometric Indicators, Bibliometrics, Citation, Citations, Evaluation, Impact, Impact Factor, Indicators, Journal, Journal Impact, Journal Impact Factor, Journal’s Integrated Impact Index, Journals

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Full Text: [2012\Scientometrics90, 659.pdf](2012/Scientometrics90,%20659.pdf)

Abstract: Visualization of subject structure based on co-word analysis is used to explore the concept network and developmental tendency in certain field. There are many visualization methods for co-word analysis. However, integration of results by different methods is rarely reported. This article addresses the knowledge gap in this field of study. We compare three visualization methods: Cluster tree, strategy diagram and social network maps, and integrate different results together to one result through co-word analysis of medical informatics. The three visualization methods have their own character: cluster trees show the subject structure, strategic diagrams reveal the importance of topic themes in the structure, and social network maps interpret the internal relationship among themes. Integration of different visualization results to one more readable map complements each other. And it is helpful for researchers to get the concept network and developmental tendency in a certain field.

Keywords: Analysis, Character, Cluster Tree, Co-Word Visualization, Integration, Knowledge, Medical, Medical Informatics, Network, Patterns, Researchers, Retrieval, Social, Social Network, Social Network Map, Strategic Diagram, Strategy, Visualization

? Colliander, C. and Ahlgren, P. (2012), Experimental comparison of first and second-order similarities in a scientometric context. *Scientometrics*, **90** (2), 675-685.

Full Text: [2012\Scientometrics90, 675.pdf](2012/Scientometrics90,%20675.pdf)

Abstract: The measurement of similarity between objects plays a role in several scientific areas. In this article, we deal with document-document similarity in a scientometric context. We compare experimentally, using a large dataset, first-order with second-order similarities with respect to the overall quality of partitions of the dataset, where the partitions are obtained on the basis of optimizing weighted modularity. The quality of a partition is defined in terms of textual coherence. The results show that the second-order approach consistently outperforms the first-order approach. Each difference between the two approaches in overall partition quality values is significant at the 0.01 level.

Keywords: Bibliographic Coupling, Cluster Analysis, Cocitation Analysis, Document-Document Similarity, First Order, Jaccard Index, Measurement, Pearsons Correlation-Coefficient, Proximity-Measures, Quality, Requirements, Resemblance, Retrieval, Saltons Cosine, Science, Science Mapping, Second-Order, Similarity Order, Statistics, Textual Coherence

? Uddin, S., Hossain, L., Abbasi, A. and Rasmussen, K. (2012), Trend and efficiency analysis of co-authorship network. *Scientometrics*, **90** (2), 687-699.

Full Text: [2012\Scientometrics90, 687.pdf](2012/Scientometrics90,%20687.pdf)

Abstract: Although co-authorship in scientific research has a long history the analysis of co-authorship network to explore scientific collaboration among authors is a relatively new research area. Studies of current literature about co-authorship networks mostly give emphasis to understand patterns of scientific collaborations, to capture collaborative statistics, and to propose valid and reliable measures for identifying prominent author(s). However, there is no such study in the literature which conducts a longitudinal analysis of co-authorship networks. Using a dataset that spans over 20 years, this paper attempts to explore efficiency and trend of co-authorship networks. Two scientists are considered connected if they have co-authored a paper, and these types of connections between two scientists eventually constitute co-authorship networks. Co-authorship networks evolve among researchers over time in specific research domains as well as in interdisciplinary research areas. Scientists from diverse research areas and different geographical locations may participate in one specific co-authorship network whereas an individual scientist may belong to different co-authorship networks. In this paper, we study a longitudinal co-authorship network of a specific scientific research area. By applying approaches to analyze longitudinal network data, in addition to known methods and measures of current co-authorship literature, we explore a co-authorship network of a relatively young and emerging research discipline to understand its trend of evolution pattern and proximity of efficiency.

Keywords: Analysis, Authors, Co-Authorship, Co-Authorship Network, Co-Authorship Networks, Coauthorship, Coauthorship Networks, Collaboration, Collaborations, Efficiency, Efficiency Analysis, Evolution, History, Impact, Inter-Country Collaboration, International Scientific Collaboration, Literature, Network, Patterns, Research, Researchers, Scientific Collaboration, Scientific Research, Scientists, Statistics, Trend, Trend Analysis

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Full Text: [2012\Scientometrics90, 701.pdf](2012/Scientometrics90,%20701.pdf)

Abstract: In this article I introduce a new indicator that measures the presence of a higher education system in the Shanghai Jiao Tong Academic Ranking of World Universities (ARWU). First, the benefits of introducing such a measure and the drawbacks associated with the possible choices of the indicator are discussed. To analyze the drawbacks, the sample of countries with presence in ARWU is split into two groups of small and large world’s GDP share. A raw indicator based upon the sum of the scores of all the universities from a country divided by its world’s GDP share shows a noticeable bias in favor of small countries, so a one-way between-groups analysis of variance is conducted to help in canceling the bias. That leads to the introduction of a new aggregate indicator that can be computed in a very simple fashion. A discussion of the performance of higher education systems using this new indicator closes the paper.

Keywords: Analysis, ARWU, Bias, Countries, Education, GDP, Gross Domestic Product, Higher Education, Indicator, Ranking, Shanghai, Universities, University, University System

? Jaric, I. and Gessner, J. (2012), Analysis of publications on sturgeon research between 1996 and 2010. *Scientometrics*, **90** (2), 715-735.

Full Text: [2012\Scientometrics90, 715.pdf](2012/Scientometrics90,%20715.pdf)

Abstract: Sturgeon species are among the commercially most valuable and the most endangered groups of fish. To assess the existing literature published within the field of sturgeon research over the past 15 years (1996-2010) we applied a bibliometric approach, in order to identify patterns and trends of the published research in this field. The analysis was performed based upon articles obtained from the ISI Web of Knowledge online database. The results revealed that although all 27 sturgeon species have been objects of the research, species that are endangered or facing a high probability of extinction have received disproportionately less attention. White sturgeon (Acipenser transmontanus) was the most frequently studied species, but it was recently surpassed by Persian sturgeon (A. persicus). Early life phases have been among the central objects of the research, and genetics, especially the use of microsatellite DNA, is becoming increasingly popular and had the highest impact. Research related to aquaculture was prominent, while the research related to hybrids (as a commodity of aquaculture production) was decreasing in popularity. Papers dealing with conservation issues were most frequently focused on European sturgeon (A. sturio). A steady increase in the number of published articles over time was observed. However, the overall citation rate declined significantly over time. During the period reviewed, the sturgeon research published in peer reviewed journals dominantly originated from the USA and EU. Nevertheless, considering the current trend in output, it is very likely that the Asian countries, mainly Iran and China, will surpass them within the next 5-10 years. International and inter-institutional collaboration both tended to increase the impact of the research. Stimulation and improvement of the international cooperation should be considered as future priorities.

Keywords: Acipenser, Analysis, Articles, Attention, Bibliometric, Bibliometry, China, Citation, Citation Analysis, Collaboration, Conservation, Cooperation, Countries, DNA, Ecological Economics, EU, Fish, Genetics, Huso, Impact, Index, International, Iran, ISI, Journals, Knowledge, Literature, Priorities, Pseudoscaphirhynchus, Publications, Published Research, Research, Scaphirhynchus, Science, Scientific-Research, Trend, Trends, USA, Web of Knowledge

? Prathap, G. (2012), A comment to the papers by Opthof and Leydesdorff, Scientometrics, 88, 1011-1016, 2011 and Waltman et al., Scientometrics, 88, 1017-1022, 2011. *Scientometrics*, **90** (2), 737-743.

Full Text: [2012\Scientometrics90, 737.pdf](2012/Scientometrics90,%20737.pdf)

Abstract: In this comment, we re-evaluate an example using a “thermodynamic” paradigm to show how bibliometrics can incorporate normalization into the evaluative process. The motivation for this is the recent exchange in the pages of this journal from two groups that have taken different positions on how normalization should be done.

Keywords: Bibliometric Indicators, Bibliometrics, Energy, Exergy, h-Index, Index, Indicators, Journal, Motivation, Normalization, Output, P-Index, Papers, Performance, Process, Quality, Quantity, Quasity, Scientometrics

? Leydesdorff, L. and Opthof, T. (2012), A rejoinder on energy versus impact indicators. *Scientometrics*, **90** (2), 745-748.

Full Text: [2012\Scientometrics90, 745.pdf](2012/Scientometrics90,%20745.pdf)

Abstract: Citation distributions are so skewed that using the mean or any other central tendency measure is ill-advised. Unlike G. Prathap’s scalar measures (Energy, Exergy, and Entropy or EEE), the Integrated Impact Indicator (I3) is based on non-parametric statistics using the (100) percentiles of the distribution. Observed values can be tested against expected ones; impact can be qualified at the article level and then aggregated.

Keywords: Charts, Citation, Citation Analysis, Citation Distributions, EEE, Energy, Entropy, Exergy, I3, Impact, Indicator, Indicators, Integration, Journals, Non-Parametric Statistics, Nonparametric, Paper, Quality, Relative Indicators, Scalar, Science, Scientometrics, Statistics, Terms

? Chuang, K.Y. and Ho, Y.S. (2012), Comments on “a bibliometric study of the trend in articles related to eutrophication published in Science Citation Index”. *Scientometrics*, **??** (??), ??-??.

Full Text: <Scientometrics-Chuang-2.pdf>; <Scientometrics-Chuang-1.pdf>; [2012\Scientometrics-Chuang.pdf](2012/Scientometrics-Chuang.pdf)

# Title: Nanostructured Materials

Incorporating [Nanostructured Materials](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5593&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=ace8f5fa16d7ee748f88b5828074600b), Formerly known as [Scripta Metallurgica et Materialia](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5607&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=4c7d46947b8aaec2607d9ecf419b0e4e)

Full Journal Title: Nanostructured Materials

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Deng, P.S.H., Yang, G.K.L. and Lin, J.S.J. (2006), Note on correction factor for estimating the diameter of embedded cylindrical fibres from metallographic sections. *Scripta Materialia*, **55** (4), 419-420.

Full Text: [2006\Scr Mat55, 419.pdf](2006/Scr%20Mat55,%20419.pdf)

Abstract: This article recalculates the correction factor for estimating the diameter of aligned cylindrical fibres from random metallographic sections as put forward in the paper of Lewis and Withers [Acta Metall. Mater. 43 (1995) 3685]. Their assertion may contain typographic and arithmetic errors (leading to an error of a factor of 2). The diameter must be estimated from longitudinal metallographic sections where the fibre diameters are partially embedded and therefore cannot be measured directly. In view of the high level of citations of the original paper, it is important to address this problem accurately and completely to ensure the successful application of their suggested method by others. The purpose of this short note is to correct their results.

Keywords: Correction Factor, Cylinder Diameter

# Title: Scandinavian Journal of Forest Research

Full Journal Title: Scandinavian Journal of Forest Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hannerz, M. (2010), Top-cited articles 2001-2009. *Scandinavian Journal of Forest Research*, **25** (1), 1-2.

Full Text: [2010\Sca J For Res25, 1.pdf](2010/Sca%20J%20For%20Res25,%201.pdf)

Keywords: Articles

# Title: Scottish Geographical Journal

Full Journal Title: [Scottish Geographical Journal](http://www.informaworld.com/smpp/title~db=all~content=t759156372)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Findlay, A. (2008), Scottish geography is dead: Long live Scottish ‘g’eography! *Scottish Geographical Journal*, **124** (4), 229-235.

Full Text: [2008\Sco Geo J124, 229.pdf](2008/Sco%20Geo%20J124,%20229.pdf)

Abstract: It has been claimed that geography journals located in so-called ‘small nations’ face special challenges. This paper suggests that three processes have demanded rapid responses from all geographical journals: globalisation of research-publishing, changing professional practices and the restructuring of the institutional context within which research is undertaken. These processes have been powerful in re-shaping geographical research. Examining the case of Scottish Geography over the last 20 years, the paper concludes there is much to be optimistic about, even though some might regret that ‘Geography’, as we once knew it, no longer exists. Recognising the challenges of the current research environment provides a useful starting point for the Scottish Geographical Journal to chart a new future for itself and for Scottish geographical endeavours.

Keywords: Bibliometrics, Context, Environment, Geography, Globalisation, Institutional, Institutional Context, Journals, Nations, Practices, Professional, Professional Practice, Rapid, Research, Restructuring, Scottish Geography, Scottish Universities, Small

# Title: Scripta Metallurgica

Formerly known as [Scripta Metallurgica](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=12963&_auth=y&_acct=C000010279&_version=1&_urlVersion=0&_userid=1187928&md5=1b84b52c39ecb9b3b51f2531569bf143), Continued as [Scripta Materialia](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5606&_auth=y&_acct=C000010279&_version=1&_urlVersion=0&_userid=1187928&md5=d9555dafc92329ae5a1913f8b4fb41f5)

Full Journal Title: Scripta Metallurgica

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0036-9748

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Achter, M.R. (1968), Adsorption model for environmental effects in fatigue crack propagation. *Scripta Metallurgica*, **2** (9), 525-527.

Full Text: [1960-80\Scr Met2, 525.pdf](1960-80/Scr%20Met2,%20525.pdf)

# Title: Scripta Nova-Revista Electronica de Geografia y Ciencias Sociales

Full Journal Title: Scripta Nova-Revista Electronica de Geografia y Ciencias Sociales

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Herrera, L.M.G. and Rodriguez, M.D.D. (2008), Gentrification processes: Research and perspectives in Spanish geography (1999-2008). *Scripta Nova-Revista Electronica de Geografia y Ciencias Sociales*, **12** (270), Sp. Iss. SI.

Abstract: Gentrification processes have important social and spatial meaning and, therefore, it is critical to understand present city changes and restructuring. The aim of this paper is to identify the approaches to the study of gentrification in Spanish research throughout the last decade. Bibliometric analysis of the articles about this subject, published in the high impact Spanish Social Sciences and Geography journals provides information about the amount and the scope of the existing research on gentrification.

Keywords: Bibliometric, Bibliometric Analysis, Brussels, Consumption, Displacement, Diversity, Elitization, Gentrification, Geography, Impact, Journals, Neighborhood, New-York-City, Research, Sciences, Spaces, Spanish Geography, Tourism

# Title: Search

Full Journal Title: Search

ISO Abbreviated Title: Search

JCR Abbreviated Title: Search

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bridgstock, M. (1993), What is scientific misconduct. *Search*, **24** (3), 75-78.

Abstract: There are disturbing signs that a consensus may not exist on what constitutes acceptable conduct in science. This article reports the results of interviews with 30 academic scientists on what they viewed as misconduct. The results indicate that, while strong consensus exists in some areas, such as plagiarism and the faking of results, there is substantial disagreement on whether practices such as publicity seeking, heavy self-citation and omitting anomalous results constitute misconduct.

Keywords: Archaeology, Science, Self-Citation

# Title: Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Defense and Law Enforcement II

Full Journal Title: Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Defense and Law Enforcement II

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Goldstein, M.L., Morris, S.A. and Yen, G.G. (2003), Bridging the gap between data acquisition and inference ontologies - towards ontology based link discovery. *Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Defense and Law Enforcement II*, **5071**, 116-127.

Abstract: Bridging the gap between low level ontologies used for data acquisition and high level ontologies used for inference is essential to enable the discovery of high-level links between low-level entities. This is of utmost importance in many applications, where the semantic distance between the observable evidence and the target relations is large. Examples of these applications would be detection of terrorist activity, crime analysis, and technology monitoring, among others. Currently this inference gap has been filled by expert knowledge. However, with the increase of the data and system size, it has become too costly to perform such manual inference. This paper proposes a semi-automatic system to bridge the inference gap using network correlation methods, similar to Bayesian Belief Networks, combined with hierarchical clustering, to group and organize data so that experts can observe and build the inference gap ontologies quickly and efficiently, decreasing the cost of this labor-intensive process. A simple application of this method is shown here, where the co-author collaboration structure ontology is inferred from the analysis of a collection of journal publications on the subject of anthrax. This example uncovers a co-author collaboration structures (a well defined ontology) from a scientific publication dataset (also a well defined ontology). Nevertheless, the evidence of author collaboration is poorly defined, requiring the use of evidence from keywords, citations, publication dates, and paper co-authorship.. The proposed system automatically suggests candidate collaboration group patterns for evaluation by experts. Using an intuitive graphic user interface, these experts identify, confirm and refine the proposed ontologies and add them to the ontology database to be used in subsequent processes.

Keywords: Analysis, Anthrax, Applications, Bibliometric Analysis, Citations, Clustering, Co-Author, Co-Authorship, Coauthorship, Collaboration, Database, Evaluation, Hierarchical Clustering, Journal, Journal Publications, Knowledge, Link Analysis, Link Discovery, Methods, Network, Networks, Ontologies, Publication, Publications, Research-and-Development, Semantic Web, Size, System, Technology

# Title: Small Ruminant Research

Full Journal Title: [Small Ruminant Research](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5161&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=cb1e64291c6c05b74451802e037ca8e4)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0921-4488

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Onwuka, C.F.I., Adetiloye, P.O. and Afolami, C.A. (1997), Use of household wastes and crop residues in small ruminant feeding in Nigeria. *Small Ruminant Research*, **24** (3), 233-237.

Full Text: [S\Sma Rum Res24, 233.pdf](S/Sma%20Rum%20Res24,%20233.pdf)

Abstract: A study was conducted of 252 households in five communities within Ogun State, Nigeria, to survey the use of household and farm wastes by small livestock holders. Over 90% of the respondents were farmers whose average farm size was 0.8 ha with cassava, maize and yam as major crops. Flock sizes were one to three sheep and one to four goats per household. Predominant household wastes and crop residues were cassava, yam, cocoyam, orange peels, maize cob and stalk, cowpea vines and husk, groundnut haulm, pods, cocoa pods, colanut pods and rice milling by-products. The most commonly fed were cassava and yam peels, cowpea husk and kitchen wastes like banana peels, plantain peels, pineapple waste, palm kernel meal, maize and sorghum fermentation wastes. The crude protein levels in these feedstuffs ranged from 1 to 23%, fibre 2 to 52% and metabolizable energy was as high as 20 MI per kg DM. Crop residue was underutilized as only 1%, 2%, 43% and 44% of the respondents fed, respectively, maize stover, maize cab, cowpea husk and yam peels to their sheep and goats. Large amounts of various crop residues (29-100%) were left in the field to rot away or were burnt. The sheep and goats were healthier and heavier when given supplemental feed. Five percent of the owners provided housing for their animals. It is suggested that more of the household wastes and crop residues could be used after proper processing. (C) 1997 Elsevier Science B.V.

Keywords: Crop Residues, Household Waste, Supplements, Sheep, Goat

# Title: Seisan Kenkyu

Full Journal Title: Seisan Kenkyu

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Suzuki, M. and Kawazoe, K. (1974), Concentration decay in a batch adsorption tank Freundlich isotherm with surface diffusion kinetics. *Seisan Kenkyu*, **26**, 275-??.

# Title: Seito Gijutsu Kenkyukaishi

Full Journal Title: Seito Gijutsu Kenkyukaishi

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Komoto, K. (1956), The conditions for preparation and natures of sulphuric acid activated carbon. *Seito Gijutsu Kenkyukaishi*, **5**, 49-71.

# Title: Seminars in Arthritis and Rheumatism

Full Journal Title: Seminars in Arthritis and Rheumatism

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yunus, M.B. (2008), Central sensitivity syndromes: A new paradigm and group nosology for fibromyalgia and overlapping conditions, and the related issue of disease versus illness. *Seminars in Arthritis and Rheumatism*, **37** (6), 339-352.

Abstract: Objectives: To discuss the current terminologies used for fibromyalgia syndrome (FMS) and related overlapping conditions, to examine if central sensitivity syndromes (CSS) is the appropriate nosology for these disorders, and to explore the issue of disease versus illness. Methods: A literature search was performed through PUBMED, Web of Science, and ScienceDirect using a number of keywords, eg, functional somatic syndromes, somatoform disorders, medically unexplained symptoms, organic and nonorganic, and diseases and illness. Relevant articles were then reviewed and representative ones cited. Results: Terminologies currently used for CSS conditions predominantly represent a psychosocial construct and are inappropriate. On the other hand, CSS seems to be the logical nosology based on a biopsychosocial model. Such terms as “medically unexplained symptoms,” “somatization,” “somatization disorder,” and “functional somatic syndromes” in the context of CSS should be abandoned. Given current scientific knowledge, the concept of disease-illness dualism has no rational basis and impedes proper patient-physician communication, resulting in poor patient care. The concept of CSS is likely to promote research, education, and proper patient management. Conclusion: CSS seems to be a useful paradigm and an appropriate terminology for FMS and related conditions. The disease-illness, as well as organic/non-organic dichotomy, should be rejected. (C) 2008 Elsevier Inc. All rights reserved.

Keywords: Central Sensitivity Syndromes, Chronic Widespread Pain, Chronic-Fatigue-Syndrome, Communication, Coronary-Artery-Disease, Disease, Disease Versus Illness, Education, Fibromyalgia, Functional, Functional Somatic Syndromes, Functional Somatic Syndromes, Hand, Irritable-Bowel-Syndrome, Knowledge, Literature, Management, Medically Unexplained Symptoms, Medically Unexplained Symptoms, Methods, Model, Overlapping, Overlapping Syndromes, Pituitary-Adrenal Axis, Placebo-Controlled Trial, Pressure-Pain Thresholds, Psychosocial, Pubmed, Research, Science, Sensitivity, Somatization, Symptoms, Tension-Type Headache, Web of Science

? Kalichman, L., Bannuru, R.R., Severin, M. and Harvey, W. (2011), Injection of botulinum toxin for treatment of chronic lateral epicondylitis: Systematic review and meta-analysis. *Seminars in Arthritis and Rheumatism*, **40** (6), 532-538.

Abstract: Objectives: Lateral epicondylitis can be chronic and difficult to manage with conservative measures such as physical therapy and corticosteroid injection. We attempted to determine the efficacy of botulinum toxin for the treatment of chronic lateral epicondylitis. Methods: We searched PUBMED, MEDLINE, CINAHL, Google Scholar, EMBASE, PEDro, and ISI Web of Science databases from inception until November 2009. Studies were included if they used any formulation of botulinum toxin A for treatment of chronic lateral epicondylitis and reported at least 1 pain outcome. One author extracted the relevant data using a standardized data extraction sheet and a second author checked the data. We performed a meta-analysis by computing effect sizes for each study separately for pain and grip strength at 3 months after injection. Impact of bias was assessed independently by 2 authors. Results: The search found 10 studies relevant to the question. Four of these were randomized controlled trials that could be pooled in a meta-analysis. Results showed a moderate effect for pain favoring botulinum toxin (effect size -0.5, 95% CI -0.9, -0.1, I(2) = 56%) at 3 months and a no effect for grip strength. Qualitative analysis of the studies that could not be pooled also showed improvement in pain, but was limited by potential bias. Conclusions: Present literature provides support for use of botulinum toxin A injections into the forearm extensor muscles (60 units) for treatment of chronic treatment-resistant lateral epicondylitis. It is minimally invasive and can be performed in an outpatient setting. (C) 2011 Elsevier Inc. All rights reserved. Semin Arthritis Rheum 40:532-538.

Keywords: Analysis, Author, Authors, Bias, Botulinum Toxin A, Chronic Radial Epicondylitis, Clinical-Trials, Corticosteroid, Databases, Double-Blind, Efficacy, Embase, Google Scholar, Grip Strength, Impact, ISI, Isi Web of Science, Lateral Epicondylitis, Literature, Medline, Meta-Analysis, Methods, Musculoskeletal Disorders, Myofascial Pain, Outcome, Pain, Physical Therapy, Prevalence, Pubmed, Randomized Controlled Trials, Randomized Controlled-Trial, Review, Science, Strength, Systematic, Systematic Review, Tennis Elbow, Tennis Elbow, Therapy, Treatment, Trigger Points, Upper-Limb

# Title: Seminars in Dialysis

Full Journal Title: Seminars in Dialysis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bennett, P.N., Breugelmans, L., Barnard, R., Agius, M., Chan, D., Fraser, D., McNeill, L. and Potter, L. (2010), Sustaining a hemodialysis exercise program: A review. *Seminars in Dialysis*, **23** (1), 62-73.

Abstract: This article reviews the literature addressing exercise programs for dialysis patients to identify elements necessary for sustaining exercise programs in this population. Literature searches for publications (January 1980-February 2009) in MEDLINE (OVID), PUBMED, CINAHL (EBSCO), EBSCOhost EJS, ProQuest Central, Web of Science, Cochrane Library, Google Scholar, ScienceDirect, Springer-Link (Kluwer), and Wiley Interscience (Blackwell) were performed. Reference lists from relevant articles were hand-searched for further publications. Criteria for inclusion included full-text primary research and review articles focused on exercise for adult hemodialysis patients. One hundred and seventy one publications were found with a primary focus on exercise in hemodialysis. of these, 28 primary research and 14 review articles addressed one or more aspects of sustainability of hemodialysis exercise programs. Factors contributing to sustainable exercise programs included: dedicated exercise professionals; encouragement to exercise intradialytically; dialysis and medical staff commitment; adequate physical requirements of equipment and space; interesting and stimulating; cost implications need to be addressed; exercise is not for everyone; requires individual prescription; and there is no age barrier to exercise on hemodialysis.

Keywords: Adult, Blood-Pressure, Cochrane, Controlled-Trial, Dialysis, Dialysis Patients, Exercise, Factors, Google Scholar, Hemodialysis, Intradialytic Exercise, Literature, Maintenance Hemodialysis, Medical, Medical Staff, Patients, Patients Receiving Hemodialysis, Physical-Activity Levels, Primary, Publications, Pubmed, Quality-Of-Life, Rehabilitation Program, Research, Review, Science, Stage Renal-Disease, Web of Science

# Title: Seminars in Nephrology

Full Journal Title: Seminars in Nephrology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Faber, M.D., Kupin, W.L., Heilig, C.W. and Narins, R.G. (1994), Common fluid-electrolyte and acid-base-problems in the intensive-care unit-selected issues. *Seminars in Nephrology*, **14** (1), 8-22.

Keywords: Central Pontine Myelinolysis, Rapid Correction, Lactic-Acidosis, Magnesium-Deficiency, Parathyroid-Hormone, Organic Osmolytes, Critical Illness, Hyponatremia, Brain, Hypomagnesemia

# Title: Seminars in Nuclear Medicine

Full Journal Title: Seminars in Nuclear Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Metz, C.E. (1978), Basic principles of roc analysis. *Seminars in Nuclear Medicine*, **8** (4), 283-298.

Full Text: [1960-80\Sem Nuc Med8, 283.pdf](1960-80/Sem%20Nuc%20Med8,%20283.pdf)

Abstract: The limitations of diagnostic “accuracy” as a measure of decision performance require introduction of the concepts of the “sensitivity” and “specificity” of a diagnostic test. These measures and the related indices, “true positive fraction” and “false positive fraction”, are more meaningful than “accuracy”, yet do not provide a unique description of diagnostic performance because they depend on the arbitrary selection of a decision threshold. The receiver operating characteristic (ROC) curve is shown to be a simple yet complete empirical description of this decision threshold effect, indicating all possible combinations of the relative frequencies of the various kinds of correct and incorrect decisions. Practical experimental techniques for measuring ROC curves are described, and the issues of case selection and curve-fitting are discussed briefly. Possible generalizations of conventional ROC analysis to account for decision performance in complex diagnostic tasks are indicated. ROC analysis is shown to be related in a direct and natural way to cost/benefit analysis of diagnostic decision making. The concepts of “average diagnostic cost” and “average net benefit” are developed and used to identify the optimal compromise among various kinds of diagnostic error. Finally, the way in which ROC analysis can be employed to optimize diagnostic strategies is suggested.

# Title: Seminars in Oncology

Full Journal Title: Seminars in Oncology

ISO Abbreviated Title: Semin. Oncol.

JCR Abbreviated Title: Semin Oncol

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Issues/Year: 6

Journal Country United States

Language: English

Publisher: W B Saunders Co

Publisher Address: Independence Square West Curtis Center, Ste 300, Philadelphia, PA 19106-339

Subject Categories:

Oncology: Impact Factor

? Dayal, H. and Kinman, J. (1983), Epidemiology of kidney cancer. *Seminars in Oncology*, **10** (4), 366-377.

Abstract: Renal-cell carcinoma usually affects those over 40 years old, and, in any age group, the disease occurs about twice as frequently among men as it does among women. The incidence of the disease has been steadily increasing over the years. In the United States, the probability of surviving after diagnosis of renal cancer has been improving since 1940 regardless of race, sex, and age at diagnosis. The relationship between SES and the chance of developing the disease is sporadic with an indication of a slightly higher risk in the upper socioeconomic classes. Urbanrural comparisons consistently suggest that a higher risk is associated with urban residence. Tobacco use is probably the only environmental factor that could be considered to be etiologically related to cancer of the kidney. A variety of studies point to a moderate but consistent association with tobacco use in the form of cigarette, cigar, or pipe smoking. The excess of the disease in males compared to females and the lower incidence in Mormons may partly be due to the confounding effect of smoking. Dietary vitamin A or vitamin A supplements may have an antipromoting effect in the development of kidney cancer. Hypotheses implicating fat and/or cholesterol intake in the etiology of cancer of the kidney appear to be too tenuous. The evidence of a relationship between concentrations of certain trace metals in drinking water and incidence of renal cancer is weak. Similarly, there is no strong indication of an increased risk among individuals exposed to radiation. In general, with the exception of the observation of an unusually high risk among coke-oven workers, occupational studies have not identified any high-risk groups. Familial aggregation, though rare, occurs with peculiar disease characteristics that may predict similar cancers in the proband’s relatives with a high degree of accuracy. In conclusion, the etiology of cancer of the kidney is poorly understood. The descriptive epidemiology of the disease provides some interesting insights into the correlates of the distribution of the disease. (abstract truncated at 400 words)

? Dorr, R.T. (1991), Chemoprotectants for cancer chemotherapy. *Seminars in Oncology*, **18** (1) Supp l 2, 48-58.

Abstract: Maximal dosing of cytotoxic chemotherapy drugs is often limited by the development of severe nonmyelosuppressive toxicities. Numerous studies have demonstrated that sulfur-containing nucleophiles can antagonize the dose-limiting effects of alkylating agents on the genitourinary tract. Examples include the use of sodium thiosulfate to prevent cisplatin-induced renal tubular necrosis and the use of sulfhydryl-containing compounds like N-acetylcysteine and 2-mercaptoethanesulfonate (mesna) to block oxazophosphorine-induced bladder toxicity. Mesna does not block the antitumor action of oxazophosphorines due to its rapid formation of the inactive dimer dimesna in the bloodstream. The active monomer is selectively reduced from dimesna in renal tubule cells, thereby limiting the inactivation of toxins like acrolein to the genitourinary tract. Recent clinical trials suggest that oral mesna has adequate bioavailability (roughly 50% by urinary thiol measurements) to prevent urotoxicity in high-dose ifosfamide regimens. In addition, mesna is stable in aqueous oral formulations. This may facilitate more convenient oral mesna dosing in protocols using high-dose cyclophosphamide or ifosfamide. Whereas agents like mesna and sodium thiosulfate complex directly with activated (electrophilic) alkylator species, chemoprotectants for the anthracyclines appear to complex with metal cofactors like iron, which are required for the production of cardiotoxicity. Several ethylenediaminetetraacetic-like agents have been evaluated, and a water-soluble piperazinyl derivative, ICRF-187, is currently undergoing clinical evaluation in patients receiving large cumulative doxorubicin doses. An initial clinical trial suggests that ICRF-187 can prevent doxorubicin-induced cardiomyopathy. As with mesna, ICRF-187 does not block the myelosuppressive or the antitumor effects of doxorubicin. Overall, these studies show that site-selective chemoprotection is now feasible for at least two major classes of anticancer agents.

# Title: Seminars in Reproductive Medicine

Full Journal Title: Seminars in Reproductive Medicine

ISO Abbreviated Title: Semin. Reprod. Med.

JCR Abbreviated Title: Semin Reprod Med

ISSN: 1526-8004

Issues/Year:

Journal Country

Language:

Publisher: Thieme Medical Publ Inc, New York

Publisher Address:

Subject Categories:

: Impact Factor

? Cramer, D.W. and Wise, L.A. (2000), The epidemiology of recurrent pregnancy loss. *Seminars in Reproductive Medicine*, **18** (4), 331-339.

Abstract: In reviewing the epidemiology of recurrent abortion (RAB), we believe it is necessary to consider the epidemiology of spontaneous abortion (SAB) as well, since it is clear that even a single pregnancy loss increases the risk for a subsequent abortion. In addition, any attempt to identify, epidemiologic risk factors for SAB or RAB must deal with the fact that at least 50% of SABs are associated with genetic abnormalities. Given that most epidemiologic studies have nor distinguished karyotypically abnormal abortuses, risk factors are likely to be underestimated. Nevertheless, there is fair agreement that a variety of factors may increase risk for SAB or RAB, including advanced maternal age, single gene mutations such as PKU or G6PD deficiency, structural abnormalities of the uterus, poorly controlled diabetes, antiphospholipid syndrome, and smoking. More controversial is the role of luteal phase defect or hyperandrogenism, alloimmune factors, genital infections, caffeine or alcohol use, and trace element or chemical exposure from ray water or in the workplace. Besides better designed epidemiologic studies to detect modifiable risk factors for SAB or RAB, there is a clear need for clinical trials of therapy for RAB which meet minimum epidemiologic standards including randomization, double-blinded (when possible), and placebo-controlled (when ethical).

Keywords: Epidemiology, Spontaneous Abortion, Recurrent Abortion, Subsequent Reproductive-Performance, Bottled Water-Consumption, Spontaneous-Abortion, Caffeine Consumption, Selenium Deficiency, Treated Pregnancies, Polycystic Ovaries, Cigarette-Smoking, Habitual Abortion, Etiologic Factors

# Title: Seminars in Respiratory and Critical Care Medicine

Full Journal Title: Seminars in Respiratory and Critical Care Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chalfin, D.B. (1999), Assessing the cost-effectiveness of emerging therapies in the ICU. *Seminars in Respiratory and Critical Care Medicine*, **20** (3), 263-270.

Full Text: Sem Res Cri Car Med20, 263.pdf

Abstract: Medical care in the United States and the developed world is increasingly under heightened financial and economic pressure to reduce cost yet maintain and even improve quality. Perhaps nowhere is this pressure more evident than in the critical care areas and intensive care units (ICUs), In part this arises from an awareness of the disproportionate amount of resources consumed by critical care patients and ICU services. American ICUs, for example, account for only 5-10% of all hospital beds yet they consume over 30% of scarce inpatient resources, a figure which according to some estimates accounts for approximately 1% of the nation’s Gross Domestic Product (GDP).(1, 2, 3) Although the total level of spending in terms of both actual numbers and percent of GDP is different for ICU services in other developed nations, this disproportionate level of spending nevertheless exists between cost of care in the ICU and resource consumption on the general medical and surgical ward.(4) However, concern over high cost is not the sole and perhaps not even the primary reason for increased scrutiny levied upon critical care. Cost concerns and budgetary issues wane if the resources which are expended yield the desired clinical benefits, in terms of higher survival and enhanced quality of life. Similarly, economic issues are magnified if there is a perception of waste and inefficiency, in that better outcomes could possibly have been attained with the same resources or even that fewer resources would have been required to attain the current level of benefit. The essence of this argument boils down to a matter of value, in terms of what one attains relative to the resources which are consumed. As health care rapidly shifts away from a fee-for-service environment to systems which embrace varying measures of economic accountability, there will be a heightened demand for quantitative approaches to technology assessment and the valuation of new and emerging therapies from a collective clinical and economic perspective, In the ICU environment, this has already occurred, due in large part to the dependence upon high technology and the ongoing evaluation of expensive therapies with still-to-be-proven benefit, This paper will discuss methods and approaches often employed for the evaluation of emerging technologies, with an emphasis upon cost-effectiveness analysis, pharmacoeconomics, and related techniques.

Keywords: ICU, Gross Domestic Product, Cost-Effectiveness, Intensive-Care Unit, Diagnosis-Related Groups, Gram-Negative Sepsis, Medical Literature, Descriptive Analysis, Resource Utilization, Clinical-Practice, Users Guides, Health-Care, Impact

# Title: Seminars in Thrombosis and Hemostasis

Full Journal Title: Seminars in Thrombosis and Hemostasis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Favaloro, E.J. (2008), Measuring the quality of journals and journal articles: The impact factor tells but a portion of the story. *Seminars in Thrombosis and Hemostasis*, **34** (1), 7-25.

Abstract: Much emphasis has been placed on the impact factor, a measure of journal article citation rates used as a surrogate marker of both journal and article quality. There is little doubt that the impact factor is an important audit of journal article usage, as it in essence provides a measure of the level of peer attention being given to articles within journals and (by extrapolation) of the level of attention being given to the journal containing those articles. However, the impact factor has its limitations and only tells a very small fraction of the overall story regarding the utility of journals and the articles within them. In addition, the impact factor can be easily manipulated. The current article includes a brief review of the current and past uses and abuses of the impact factor and describes some of its strengths and limitations. In addition, a review of past publications, primarily from this journal, has been undertaken to help show the potential use of alternative measures of journal utility, such as Internet-based journal sessions and article downloads. The evaluation of previously published articles also helps serve to illustrate, by example, some of the limitations to the use of the impact factor as the sole determinant of a journal’s “quality.”.

Keywords: Alternative, Audit, Citation, Evaluation, Extrapolation, Impact, Impact Factor, Journal, Journal Article, Journal Articles, Journals, Potential, Publications, Quality, Quality of, Rates, Review, Small, Surrogate, Utility

? Kenet, G., Aronis, S., Berkun, Y., Bonduel, M., Chan, A., Goldenberg, N.A., Holzhauer, S., Iorio, A., Journeycake, J., Junker, R., Male, C., Manco-Johnson, M., Massicotte, P., Mesters, R., Monagle, P., van Ommen, H., Rafini, L., Simioni, P., Young, G. and Nowak-Gottl, U. (2011), Impact of persistent antiphospholipid antibodies on risk of incident symptomatic thromboembolism in children: A systematic review and meta-analysis. *Seminars in Thrombosis and Hemostasis*, **37** (7), 802-809.

Full Text: 2011\Sem Thr Hem37, 802.pdf

Abstract: The aim of this study was to estimate the impact of antiphospholipid (aPL) antibodies on the risk of incident thromboembolism (TE; arterial and venous) in children via meta-analysis of published observational studies. A systematic search of electronic databases (Medline, EMBASE, OVID, Web of Science, The Cochrane Library) for studies published from 1966 to 2010 was conducted using keywords in combination both as MeSH terms and text words. Two authors independently screened citations and those meeting the a priori defined inclusion criteria were retained. Data on year of publication, study design, country of origin, number of patients/controls, ethnicity, TE type, and frequency of recurrence were abstracted. Heterogeneity across studies was evaluated, and summary odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using either fixed-effects or random-effects models. Of 504, 16 pediatric studies met the inclusion criteria. In total 1403 patients and 1667 population-based controls <= 18 years were enrolled. No significant heterogeneity was discerned across studies, and no publication bias was detected. Thus, data from arterial and venous TE were analyzed together. In addition, meta-regression analysis did not reveal statistically significant differences between site of TE, age at first TE, country, or publication year. A statistically significant association with a first TE was demonstrated for persistent aPL antibodies, with an overall summary ORs/CI of 5.9/3.6-9.7 (arterial 6.6/3.5-12.4; deep vein thrombosis 4.9/2.2-10.9). The present meta-analysis indicates that detection of persistent aPL is clinically meaningful in children with, or at risk for, TE and underscores the importance of pediatric thrombophilia screening programs.

Keywords: Analysis, Antibodies, Antiphospholipid Antibodies, Arterial Ischemic-Stroke, Association, At Risk, Authors, Bias, Cerebral Venous Thrombosis, Childhood, Children, Citations, Cochrane, Confidence Intervals, Databases, Deep Vein Thrombosis, Design, Differences, Embase, Ethnicity, Factor-V-Leiden, Follow-Up, Frequency, Impact, Infants, Lupus-Erythematosus, Medline, Meta Analysis, Meta-Analysis, Multicenter, Observational, Observational Studies, Patients, Pediatric, Publication, Publication Bias, Recurrence, Registry, Review, Risk, Science, Screening, Systematic, Systematic Review, Thromboembolism, Thrombophilia, Thrombosis, Web of Science, Web-of-Science

? Bidlingmaier, C., Kenet, G., Kurnik, K., Mathew, P., Manner, D., Mitchell, L., Krumpel, A. and Nowak-Gottl, U. (2011), Safety and efficacy of low molecular weight heparins in children: A systematic review of the literature and meta-analysis of single-arm studies. *Seminars in Thrombosis and Hemostasis*, **37** (7), 814-825.

Full Text: 2011\Sem Thr Hem37, 814.pdf

Abstract: Within the last two decades low molecular weight heparins (LMWH) have gained increasing widespread use as anticoagulants in children. The use of LMWH has been implemented into clinical care even though there is a lack of firm evidence on the efficacy and safety of LMWH in this population due to the absence of sufficiently powered randomized controlled trials. In the absence of clinical trials, we performed a meta-analysis of available single-arm studies using LMWH in children. A systematic search of electronic databases (Medline, EMBASE, OVID, Web of Science, The Cochrane Library) for studies published from 1980 to 2010 was conducted using keywords in combination both as MeSH terms and text words. Two authors independently screened citations and those meeting a priori defined inclusion criteria were retained. Data on year of publication, study design, country of origin, number of patients, ethnicity, venous thromboembolic events type, and frequency of recurrence and major bleedings were abstracted. Pooled incidence rates (IR) including 95% confidence intervals (95% CIs) on efficacy and safety data of LMWH administration on primary prophylaxis, as well as on secondary prophylaxis in children following symptomatic thromboembolism (TE) were shown. We included 2251 pediatric patients derived from 35 single-arm studies from 12 study countries who were eligible for analysis in the present systematic review. Pooled incidence rates (95% CI) to develop first TE on primary prophylaxis, further TE event on LMWH secondary prophylaxis, or a major bleeding event on LMWH were 0.047 (0.023 to 0.091), 0.052 (0.037 to 0.073) for efficacy, and 0.054 (0.039 to 0.074) for safety (treatment data only), respectively. Efficacy and safety data are comparable with adult data. The present systematic review suggests that use of LMWH in children as primary prophylaxis and in treatment of symptomatic thrombosis is effective and safe. However, properly designed randomized controlled trials are needed.

Keywords: Acute Lymphoblastic-Leukemia, Adult, Analysis, Anticoagulants, Authors, Care, Cerebral Sinovenous Thrombosis, Children, Citations, Clinical Trials, Cochrane, Confidence Intervals, Countries, Daily Enoxaparin, Databases, Design, Efficacy, Embase, Ethnicity, Frequency, Heparins, Incidence, Ir, Ischemic-Stroke, L-Asparaginase Treatment, Literature, Low, Low Molecular Weight Heparin, Low-Molecular-Weight, Medline, Meta Analysis, Meta-Analysis, Molecular, Multicenter Cohort, Patients, Pediatric, Pediatric Thrombosis, Pediatric-Patients, Primary, Primary Prophylaxis, Prophylactic Therapy, Prophylaxis, Publication, Randomized Controlled Trials, Randomized Controlled-Trial, Recurrence, Review, Safety, Safety and Efficacy, Science, Systematic, Systematic Review, Thromboembolism, Thrombosis, Treatment, Venous Thromboembolic Disease, Web of Science, Web-of-Science

# Title: Sen-I Gakkaishi

Full Journal Title: [Sen-I Gakkaishi](http://fiber.jstage.jst.go.jp/en/)

ISO Abbreviated Title: Sen-I Gakkaishi

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ISSN: 0037-9875

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Journal Country Japan

Language: English

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Publisher Address: Kamiosaki 3-3-9, 208 Shinagawa-Ku, Tokyo 141, Japan

Subject Categories:

Materials Science, Textiles: Impact Factor

Polymer Science: Impact Factor 0.170, 63/69 (2000)

? Nakamura, S. and Sanada, N. (1997), Preparation of cellulose derivatives with long alkylamino groups in the side chains and their adsorption behavior of heavy metal ions. *Sen-I Gakkaishi*, **53** (10), 467-470.

Abstract: 6-(Alkylamino) deoxycelluloses were prepared from 6-chlorodeoxycellulose and n-alkylamines, CH3 (CH2)mNH2 (m = 5, 11, 17), and their adsorption behavior of divalent heavy metals ions, Co2+, Ni2+, Cu2+ and Cd2+, was as examined. Metal ions were adsorbed on these alkylaminocelluloses in weakly acidic solution. The proportion of adsorbed metal ions increased with increasing pH of the solution and was dependent on the length of the alkyl chain in the order of n-stearylaminodeoxycellulose (m = 17) > n-laurylaminodeoxycellulose (m = 11) > n-hexylaminodeoxycellulose (m = 5). The adsorptive activity of n-laurylaminodeoxycellulose was found to be in the order of Cu2+ > Co2+, Cd2+ > Ni2+. Since these adsorbents had a single coordination site in the pendant groups, the proportion of adsorption against metal ions was much lower than that of cellulose derivatives having two coordination sites in the pendant groups reported previously.

? Aoki, N., Tanaka, K., Sakamoto, M. and Furuhata, K. (1999), Sorption of metal ions by bead cellulose grafted with amidoximated polyacrylonitrile. *Sen-I Gakkaishi*, **55** (12), 569-575.

Abstract: Bead cellulose samples with amidoximated polyacrylonitrile grafts were examined as sorbents for metal ions. The amount of the ion sorbed from 40 mM solution in a fixed period increased in the order Cd(II), Zn(II) < Pb(II) < Cu(II) much less than Ag(I). The treatment of bead samples with NaOH solutions caused the swelling, and both the amount of the metal ion sorbed and the sorption rate increased considerably after the NaOH treatment. More than 90% of metal ions sorbed by the beads were desorbed in 0.5 M H2SO4. The sorption-desorption-NaOH treatment cycle could be repeated without significant reduction in the extent of sorption.

Keywords: Uranium Adsorption, Chelating Resins, Seawater, Recovery, Adsorbent, Fiber, Imidedioxime, Stability, Ability

? Hamada, K., Oshiki, K. and Shirai, H. (1999), Sorption of fluorinated azo dyes containing two sulfonate groups by a nylon 6 film. *Sen-I Gakkaishi*, **55** (12), 584-589.

Abstract: Derivatives of disodium 1-phenylazo-2-hydroxy-3,6-naphthalenedisulfonate some of which contain a trifluoromethyl or methyl group, were prepared and their sorption behavior by a nylon 6 film at pH3 was investigated. The dye uptake by the nylon 6 film increased linearly with sorption lime. The slopes of the linear plots varied depending on the dye structure: the kind and number of the substituents in the dyes affected the slopes. The analysis of the sorption isotherms based on a dual sorption mechanism, which consists of partition and Langmuir type sorption, gave the partition coefficients (K-P) and the number of binding sites (n) and intrinsic binding constants (K-L) for the Langmuir type sorption. The introduction of the trifluoromethyl or methyl group into the dye molecules hardly influenced K-P and n, while it changed the K-L values significantly. Furthermore, thermodynamic parameters, enthalpy change and entropy change, for the Langmuir type sorption were greatly affected by the replacement of the substituents, suggesting that the hydrophobic interaction should be concerned with the Langmuir type sorption.

Keywords: Water-Soluble Polymers, Monoazo Dyes, Atoms

# Title: Sensor Letters

Full Journal Title: Sensor Letters

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fujiwara, Y. and Amao, Y. (2006), Fluorescence behavior of pyrene-1-butylic acid chemisorption layer onto nano-porous anodic oxidized aluminum with myristic acid layer for optical oxygen sensing. *Sensor Letters*, **4** (2), 139-143.

Full Text: Sen Let4, 139

Abstract: The fluorescence behavior of pyrene-1-butylic acid (PBA) chemisorption layer onto nano-porous anodic oxidized aluminum with a myristic acid layer was investigated and its device was applied as a fluorescence oxygen sensing material. When the ratio of [myristic acid]/[PBA] onto anodic oxidized aluminum plate increased, the fluorescence intensity due to monomer emission increased and the intensity due to excimer emission decreased. These results show that the polarity of the microenvironment around PBA molecules increased by chemisorption of myristic acid and the excimer formation between PBA molecules was suppressed by the myristic acid layer onto nano-porous anodic oxidized aluminum plate. Both of fluorescence attributed to monomer and excimer were quenched by oxygen. The I-0/I-100 values, where I-0 and I-100 represent the detected fluorescence intensities from a substrate exposed to 100% argon and 100% oxygen, respectively, in monomer emission increased with increasing the ratio of myristic acid to PBA. In contrast, the I-0/I-100 values in excimer emission decreased with increasing the ratio of myristic acid to PBA. The PBA onto anodic oxidation of aluminum plates with myristic acid layer obey the modified Stern-Volmer equation and the Stern-Volmer constant, K-SV at 376 nm attributed to monomer and 461 nm attributed to excimer increased and decreased with increasing the ratio of myristic acid to PBA.

Keywords: Optical Oxygen Sensing, Pyrene, Nano-Porous Anodic Oxidized Aluminum, Fluorescence, Infrared Spectroscopic Analysis, 1-Pyrenedecanoic Acid, Luminescence Probe, Aqueous-Solutions, Carboxylic-Acids, Surfaces, Adsorption, Sensor, Film, Polyelectrolytes

# Title: Sensors

Full Journal Title: Sensors

ISO Abbreviated Title: Sensors

JCR Abbreviated Title: Sensors

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Carnaz, L., Batistao, M.V. and Coury, H.J.C.G. (2010), A review of direct neck measurement in occupational settings. *Sensors*, **10** (12), 10967-10985.

Abstract: No guidelines are available to orient researchers on the availability and applications of equipment and sensors for recording precise neck movements in occupational settings. In this study reports on direct measurements of neck movements in the workplace were reviewed. Using relevant keywords two independent reviewers searched for eligible studies in the following databases: Cinahal, Cochrane, EMBASE, Lilacs, PUBMED, MEDLINE, PEDro, Scopus and Web of Science. After applying the inclusion criteria, 13 articles on direct neck measurements in occupational settings were retrieved from among 33,666 initial titles. These studies were then methodologically evaluated according to their design characteristics, exposure and outcome assessment, and statistical analysis. The results showed that in most of the studies the three axes of neck movement (flexion-extension, lateral flexion and rotation) were not simultaneously recorded. Deficiencies in available equipment explain this flaw, demonstrating that sensors and systems need to be improved so that a true understanding of real occupational exposure can be achieved. Further studies are also needed to assess neck movement in those who perform heavy-duty work, such as nurses and electricians, since no report about such jobs was identified.

Keywords: Air-Traffic-Controllers, Analysis, Assessment, Cervical Movement, Cervical-Spine, Cochrane, Databases, Design, Direct Measurements, Exposure, Gender-Differences, Guidelines, Measurement, Medline, Motion, Movement, Movements, Musculoskeletal Disorders, Nurses, Occupational, Occupational Exposure, Outcome, Physical Workload, Portable Equipment, Posture, Pubmed, Reliability, Researchers, Review, Risk-Factors, Science, Scopus, Statistical, Web of Science, Workplace

# Title: Sensors and Actuators B: Chemical

Full Journal Title: [Sensors and Actuators B: Chemical](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5283&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=f0b5026e6156e1718bcc54e4b31f3397)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0925-4005

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hartmann, P., Leiner, M.J.P. and Lippitsch, M.E. (1995), Response characteristics of luminescent oxygen sensors. *Sensors and Actuators B: Chemical*, **29** (1-3), 251-257.

Full Text: [1995\Sen Act B29, 251.pdf](1995/Sen%20Act%20B29,%20251.pdf)

Abstract: Nonlinear Stern-Volmer quenching characteristics are a common feature of oxygen sensors containing Ru(II) complexes immobilized in solid-state matrices. We discuss the origins of this behaviour and address the implications of the molecular processes on sensor performance with the help of two different sensor systems: (1) For tris(2,2’-bipyridyl)Ru(II) dichloride (Rubpy) adsorbed on silica-gel the influence of both the adsorption isotherm and heterogeneity of the indicator’s environment significantly contributes to the intensity and lifetime Stern-Volmer behaviour. A modified method to determine an average lifetime from parameters received by a multi-exponential decay analysis is employed to show that static quenching is absent in this system. (2) For tris(4,7’-diphenyl-1,10’-phenanthroline) diperchlorate (RuPh(2)phen) dissolved in polystyrene a two-component approach is shown to be adequate for the description of the intensity and mean lifetime Stern-Volmer behaviour, as well as the excited state decay. The origin of this behaviour is discussed in consideration of lifetime distributions present in disordered media. The pre-exponentially weighted mean lifetime is used to show that static quenching is also absent in this system. The importance of the thermal history of the sample is noted.

Keywords: Oxygen Sensors, Luminescence, Transfer Excited-States, Metal-Complexes, Silica-Gel, Photophysics, Photochemistry, Distributions, Surfaces

Zeng, J., Almadidy, A., Watterson, J. and Krull, U.J. (2003), Interfacial hybridization kinetics of oligonucleotides immobilized onto fused silica surfaces. *Sensors and Actuators B: Chemical*, **90** (1-3), 68-75.

Full Text: [S\Sen Act B90, 68.pdf](S/Sen%20Act%20B90,%2068.pdf)

Abstract: Fused silica optical fibers have been used in an intrinsic mode optical configuration as biosensors for fluorescence based detection of hybridization of nucleic acids. In this work, the kinetics of hybridization of single-stranded oligonucleotides that were covalently immobilized were studied. The probe DNA was dT20, and the target was Fluorescein-labeled non-complementary (dT20) or complementary (dA20) oligonucleotide. Chronofluorimetric monitoring of the adsorption and hybridization processes was used to investigate oligonucleotide films of different density, in different salt concentrations, at temperatures of 25 and 40 °C, with the concentration of the target DNA being 0.005–0.1 μM. Mathematical models based on first- and second-order Langmuir adsorption have been examined to describe both the adsorption and the hybridization processes. Experimental data were processed using the models, and the hybridization kinetics were calculated. Hybridization kinetics on these optical fiber DNA sensors was found to be up to three orders faster than results presented for a number of other experiments using different immobilization chemistries.

Keywords: Biosensor, DNA, Fluorescence, Hybridization, Kinetics, Optical Fiber

# Title: Seoul Journal of Medicine

Full Journal Title: Seoul Journal of Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lee, C.S., Yoon, B.J. and Chi, J.G. (1994), Publication output and growth of Korean medical papers published in science citation index journals during the 1980s: A comparison with SCI Korean chemistry papers. *Seoul Journal of Medicine*, **35** (3), 137-154.

# Title: Separation and Purification Methods

Full Journal Title: [Separation and Purification Methods](http://www.dekker.com/servlet/product/productid/SPM)

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Journal Country United States

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Publisher Address: 270 Madison Ave, New York, NY 10016

Subject Categories:

Chemistry, Analytical: Impact Factor 1.286, 30/66 (1999), Impact Factor 3.556, 4/65 (2000), Impact Factor 2.250, 11/68 (2001), Impact Factor 0.941, 45/68 (2002), Impact Factor 1.222, / (2003), Impact Factor 6.667, 1/70 (2004)

Engineering, Chemical: Impact Factor 1.286, 11/110 (1999), Impact Factor 3.556, 1/117 (2000), Impact Factor 2.250, 5/123 (2001), Impact Factor 0.941, 30/126 (2002), Impact Factor 1.222, 20/119 (2003), Impact Factor 6.667, 1/116 (2004)

? Barker, P.E. and Ganetsos, G. (1988), Chemical and biochemical separations using preparative and large-scale batch and continuous chromatography. *Separation and Purification Methods*, **17** (1), 1-65.

Full Text: [1988\Sep Pur Met17, 1.pdf](1988/Sep%20Pur%20Met17,%201.pdf)

Abstract: A comprehensive literature review has been carried out on the sorption of copper ions onto various biosorbents. Extensive research has been carried out using peat as a sorbent and the sorption capacity of copper on different peats varies by a factor of over fifty. Furthermore, this paper identifies that copper sorption capacities have been reported for over thirty other different biosorbents. The paper reviews the capacities of the various biosorbents for copper and discusses the range of kinetic mechanisms used by different researches to correlate kinetic experimental data. The suitability of the various kinetic models for the sorption of copper from wastewaters onto different biosorbents is discussed.

The review identifies several deficiencies in the literature. Many of the studies on equilibrium isotherms only apply one method of analysis. Researchers fail to test experimental equilibrium date using several models and do not determine the best tit model by error analysis or by postulating a sorption mechanism. The same criticism is valid for kinetic studies. The application of more than one kinetic model is extremely rare. Another major problem arises in the characterisation of adsorbent materials, since very little information is provided on surface area, pore size distribution, surface activity, particle size, hardness or attrition rates and influence of pH. These are key factors in developing and designing wastewater treatment systems.

Keywords: Biosorbents, Peat, Copper, Sorption

Zouboulis, A.I., Matis, K.A. and Hancock, I.C. (1997), Biosorption of metals from dilute aqueous solutions. *Separation and Purification Methods*, **26** (2), 255-295.

Full Text: [1997\Sep Pur Met26, 255.pdf](1997/Sep%20Pur%20Met26,%20255.pdf)

Abstract: Dilute aqueous solutions, generated or used by industry, can contain a variety of different metal ions. Various processes are suitable for reclamation of toxic metals and among them, attention is paid here to biosorption. The ability of microorganisms to remove metal ions from solution is a well known phenomenon. Industrial applications of biosorption often make use of dead biomass, which does not require nutrients and can be exposed to environments of high toxicity. Experimental laboratory batch experiments are described for actinomycetes, fungi and for activated sludge, as the metal biosorbents, providing insight into cadmium biosorption. Non-living biomass showed greater binding capacities for cadmium (a priority pollutant) than living biomass. Engineering considerations are central in decisions concerning the commercial future of biosorption and a practical solution is needed for certain problems, such as the efficient separation of metal-loaded biomass.

Keywords: Heavy-Metals, Froth Flotation, Ion-Exchange, Waste-Water, By-Products, Removal, Biomass, Accumulation, Adsorption, Algae

McKay, G., Ho, Y.S. and Ng, J.C.P. (1999), Biosorption of copper from waste waters: A review. *Separation and Purification Methods*, **28** (1), 87-125.

Full Text: [1999\Sep Pur Met28, 87.pdf](1999/Sep%20Pur%20Met28,%2087.pdf)

Abstract: A comprehensive literature review has been carried out on the sorption of copper ions onto various biosorbents. Extensive research has been carried out using peat as a sorbent and the sorption capacity of copper on different peats varies by a factor of over fifty. Furthermore, this paper identifies that copper sorption capacities have been reported for over thirty other different biosorbents. The paper reviews the capacities of the various biosorbents for copper and discusses the range of kinetic mechanisms used by different researches to correlate kinetic experimental data. The suitability of the various kinetic models for the sorption of copper from wastewaters onto different biosorbents is discussed. The review identifies several deficiencies in the literature. Many of the studies on equilibrium isotherms only apply one method of analysis. Researchers fail to test experimental equilibrium date using several models and do not determine the best fit model by error analysis or by postulating a sorption mechanism. The same criticism is valid for kinetic studies. The application of more than one kinetic model is extremely rare. Another major problem arises in the characterisation of adsorbent materials, since very little information is provided on surface area, pore size distribution, surface activity, particle size, hardness or attrition rates and influence of pH. These are key factors in developing and designing wastewater treatment systems.

Keywords: Biosorbents, Peat, Copper, Sorption, Agricultural By-Products, Highly Porous Chitosan, Heavy-Metal Ions, Aqueous-Solutions, Activated Carbons, *Rhizopus-arrhizus*, *Zoogloea-ramigera*, Mass-Transfer, Cu(II) Adsorption, Landfill Leachate

Notes: highly cited

Ho, Y.S., Ng, J.C.Y. and McKay, G. (2000), Kinetics of pollutant sorption by biosorbents: Review. *Separation and Purification Methods*, **29** (2), 189-232.

Full Text: [S\Sep Pur Met29, 189.pdf](S/Sep%20Pur%20Met29,%20189.pdf)

Abstract: A review of the mechanisms of solute sorption onto various biosorbents has been performed. The mechanisms have been subdivided into reaction based systems and diffusion based systems and the literature has been reviewed in accordance with these two groups. The range of solute-sorbent systems reviewed include metal ions, dyestuffs and several organic substances in aqueous systems onto a wide range of biosorbents and mineral earths. Extensive tables are presented summarising isotherm types, sorption capacities, kinetic models which have been applied particularly to biosorbent systems but also to many other adsorbent materials.

Keywords: Aqueous-Solution, Basic-Dyes, Biogas Residual Slurry, Biosorbents, Color Removal, Granular Activated Carbon, Isotherm, Kinetic, Kinetics, Liquid-Phase Adsorption, Mass-Transfer Processes, Metal, Review, Sorption, Sphagnum Moss Peat, Surface-Diffusion, Waste-Water

Sağ, Y. (2001), Biosorption on heavy metal metals by gungal biomass and modeling of fungal biosorption: A review. *Separation and Purification Methods*, **30** (1), 1-48.

Full Text: [S\Sep Pur Met30, 1.pdf](S/Sep%20Pur%20Met30,%201.pdf)

Abstract: The wastewaters discharged from chemical industries which may contain heavy metal ions have toxic effect on all the living organisms. Because of this, disposal of them to the environment is a major threat to both human health and ecosystem. So the development of new technologies is required to treat wastewaters as an alternative to traditional physicochemical processes. Biosorption, the process of passive cation binding by dead or Living biomass, represents a potentially cost-effective way of eliminating toxic heavy metals from industrial waste waters. While the abilities of microorganisms ro remove metal ions in solution have been extensively studied, fungi have been recognized as a promising class of low-cost adsorbents for removal of heavy-metal ions from aqueous waste streams. Algae, fungi and bacteria differ from each other in their constitution, giving rise to different mechanisms of metal biosorption. The paper reviews the biosorption capacities of various fungi (free or immobilized or subjected to physical and chemical treatments) and, chitin and chitosan, important fungal cell wall components, in different reactor systems for heavy metal ions and discusses the fungal biosorption mechanisms. To explore the biosorption mechanisms, it is necessary to identify the functional groups involved in the biosorption process. As single toxic metallic species rarely exist in natural and waste waters, any approach that attempts to removal heavy metals from multi-component systems using fungi would be more realistic. The effects of various combinations of the metal ions on the biosorption capacity of various fungi are discussed and the actions of the metal ion combinations synergistic or antagonistic are identified. Equilibria and capacity relationships for mono-component systems are well established and quantitatively expressed by various types of adsorption isotherms. In the case of multi-metal systems, models should be modified in order to take into account all metals and cover experimental data over a wide range of solution concentrations. The researcher is often puzzled as to what are the basic differences or similarities between the isotherms and what isotherm to select for practical use to predict adsorption capacities or to incorporate it in predicting breakthrough of columnar operations. The paper reviews the range of equilibrium sorption models, and diffusion and sorption models in different reactor systems used by different researchers to correlate experimental data for fungal biosorption.

Keywords: Wastewater, Fungi, Heavy Metal Ions, Biosorption, *Rhizopus-arrhizus*, Ion-Exchange, *R-arrhizus*, Aqueous-Solutions, Multicomponent Biosorption, Liquid-Chromatography, *Penicillium* Biomass, Uranium Biosorption, Chitin Derivatives, Mathematical-Model

# Title: Separation and Purification Reviews

Full Journal Title: Separation and Purification Reviews

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kyriakopoulos, G. and Doulia, D. (2006), Adsorption of pesticides on carbonaceous and polymeric materials from aqueous solutions: A review. *Separation and Purification Reviews*, **35** (3), 97-191.

Full Text: [2006\Sep Pur Rev35, 97.pdf](2006/Sep%20Pur%20Rev35,%2097.pdf)

Abstract: Carbonaceous and polymeric materials have been extensively used in adsorption processes for the removal of pesticides from aqueous solutions. The aim of this review is the systematic and comparative presentation of the possibilities of the above adsorbents, arising from the data reported in the literature for the period 1990 - 2004. A brief description of each article is given in tables. The data is divided into two groups, based on the chemical structure of adsorbent (carbonaceous or polymeric material) and is given in tables. In each table information on the type of adsorbent (powder, granular, fibers, cloths, resins, cartridges etc), pesticide structure, experimental conditions, aim and results of each work, is reported. In addition, data is included concerning single pesticides adsorption, competitive adsorption, parameters of adsorption isotherms (Langmuir, Freundlich, Dubinin-Radushkevich) and kinetic model’s parameters (homogeneous surface diffusion model-HSDM, equivalent background compound-EBC, Peel model), such as surface diffusion coefficients and mass transfer coefficients. Information on adsorption yields, effect of various factors on adsorption effectiveness, static or continuous operation, laboratory, pilot or industrial scale process and combination of adsorption with other methods, is also included.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherms, Aqueous Solutions, Combined Physicochemical Processes, Competitive Adsorption, Data, Diffusion, Drinking-Water, Dubinin-Radushkevich, Equilibrium Model’S Parameters, Fibers, Floc-Blanket Reactors, Freundlich, Humic Substances, Industrial, Isotherms, Kinetic, Kinetic Model’S Parameters, Langmuir, Literature, Mass Transfer, Model, Natural Organic-Matter, Pesticides, Polymeric Adsorbents, Pore-Size Distribution, Powdered Activated Carbon, Process, Processes, Removal, Review, Surface Diffusion, Surface Diffusivities, Water-Treatment

# Title: Separation and Purification Technology

Full Journal Title: [Separation and Purificatfion Technology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5284&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=671f458fa88ac1db75038b18945bf4b9)

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Subject Categories:

Chemistry, Analytical: Impact Factor 0.091, 64/65 (1998), Impact Factor 0.707, 51/66 (1999), Impact Factor 0.539, 50/117 (2000)

Engineering, Chemical: Impact Factor 0.091, 100/113 (1998), Impact Factor 0.707, 31/110 (1999), Impact Factor 0.539, 50/117 (2000), Impact Factor 0.552, 61/123 (2001), Impact Factor 1.004, 25/126 (2002), Impact Factor 1.355, 14/119 (2003), Impact Factor 1.227, 29/116 (2004), Impact Factor 1.752, 15/116 (2005), Impact Factor 2.879, 11/128 (2009)

Furuya, E.G., Chang, H.T., Miura, Y. and Noll, K.E. (1997), A fundamental analysis of the isotherm for the adsorption of phenolic compounds on activated carbon. *Separation and Purification Technology*, **11** (2), 69-78.

Full Text: [S\Sep Pur Tec11, 69.pdf](S/Sep%20Pur%20Tec11,%2069.pdf)

Abstract: The Freundlich isotherm has been widely used in the design of activated-carbon adsorption processes. The isotherm is easy to use and is applicable to a wide spectrum of organic compounds and adsorbents. The main drawback for the isotherm is that it is an empirical formula requiring experiments to determine its coefficients. To alleviate this drawback, a procedure is developed in this study to correlate the Freundlich coefficients-with the basic properties of three components involved in adsorption (adsorbate, adsorbent and solvent). Chloro-and nitrophenols were used as the test adsorbates, and granular activated carbon (GAG) was used as the adsorbent. The isotherm data showed that the percentage of the GAC pore surface covered by phenolic molecules was a better measurement for the amount adsorbed than the traditional mass-based solid concentration. A solution concentration normalized with respect to the solubility of the phenolics was used to account for the effects of phenol-water interactions. Isotherms of surface coverage versus normalized concentration conformed very well to a modified Freundlich model. The modified Freundlich exponent (l/n’) was found to have an inverse linear relationship with the electron density of phenolics calculated from molecular orbital theory. The correlation will allow the prediction a priori of l/n’ from the molecular structures of the adsorbate and adsorbent. (C) 1997 Elsevier Science B.V.

Keywords: Activated Carbon, Adsorption Isotherm, Chlorophenol, Molecular Orbital, Nitrophenol, Surface Coverage

Shu, H.T., Li, D.Y., Scala, A.A. and Ma, Y.H. (1997), Adsorption of small organic pollutants from aqueous streams by aluminosilicate-based microporous materials. *Separation and Purification Technology*, **11** (1), 27-36.

Full Text: [S\Sep Pur Tec11, 27.pdf](S/Sep%20Pur%20Tec11,%2027.pdf)

Abstract: Organic pollution in industrial waste streams is of growing environmental concern. Adsorption has been applied to remove organics from aqueous solutions. Activated carbon and polymer resin are the most commonly used adsorbents. In this work, a novel class of aluminosilicate-based microporous materials with good adsorption capacity and high selectivity are investigated.

In order to adsorb organic molecules selectively from aqueous solution, the adsorbents must be hydrophobic. Phenol and chlorinated phenols were adsorbed by three different adsorbents: pillared clays, silicalite and zeolite beta. Pillared clays were modified by incorporating a non-ionic surfactant of the general formula C12-14H25-29O (CH2CH2O)5H (Tergitol 15S-5). Also, high Si/Al ratio zeolites were used for this purpose. Factors which are important in determining the selectivity and adsorption capacity of these adsorbents are the hydrophobicity of the adsorbent, the size of the organic, and the diameter of channels which are accessible to the adsorbate. (C) 1997 Elsevier Science B.V.

Keywords: Adsorption, Phenol, Pillared Clays, Silicalites, Zeolite Beta, Immobilized Enzymes, Silicalite, Clays, Sorption, Complexes, Benzene

Furuya, E.G., Chang, H.T., Miura, Y. and Noll, K.E. (1997), A fundamental analysis of the isotherm for the adsorption of phenolic compounds on activated carbon. *Separation and Purification Technology*, **11** (2), 69-78.

Full Text: [S\Sep Pur Tec11, 69.pdf](S/Sep%20Pur%20Tec11,%2069.pdf)

Abstract: The Freundlich isotherm has been widely used in the design of activated-carbon adsorption processes. The isotherm is easy to use and is applicable to a wide spectrum of organic compounds and adsorbents. The main drawback for the isotherm is that it is an empirical formula requiring experiments to determine its coefficients. To alleviate this drawback, a procedure is developed in this study to correlate the Freundlich coefficients-with the basic properties of three components involved in adsorption (adsorbate, adsorbent and solvent). Chloro-and nitrophenols were used as the test adsorbates, and granular activated carbon (GAG) was used as the adsorbent. The isotherm data showed that the percentage of the GAC pore surface covered by phenolic molecules was a better measurement for the amount adsorbed than the traditional mass-based solid concentration. A solution concentration normalized with respect to the solubility of the phenolics was used to account for the effects of phenol-water interactions. Isotherms of surface coverage versus normalized concentration conformed very well to a modified Freundlich model. The modified Freundlich exponent (l/n’) was found to have an inverse linear relationship with the electron density of phenolics calculated from molecular orbital theory. The correlation will allow the prediction a priori of l/n’ from the molecular structures of the adsorbate and adsorbent. (C) 1997 Elsevier Science B.V.

Keywords: Activated Carbon, Adsorption Isotherm, Chlorophenol, Molecular Orbital, Nitrophenol, Surface Coverage

Feng, M.H., Mei, J., Hu, S.W., Janney, S., Carruthers, J., Holbein, B., Huber, A. and Kidby, D. (1997), Selective removal of iron from grape juice using an iron(III) chelating resin. *Separation and Purification Technology*, **11** (2), 127-135.

Full Text: [S\Sep Pur Tec11, 127.pdf](S/Sep%20Pur%20Tec11,%20127.pdf)

Abstract: This work reports the results of iron removal from grape juice with an iron(III) chelating resin in both batch separation and column separation processes. The separation experiments indicated that the iron(III) chelating resin removed iron selectively and effectively from grape juice.

The iron content in grape juice was reduced from 1000 ppb to 2 ppb with a batch separation at a ratio of 1 g of the resin to 100 ml of grape juice. By using a sequential multi-batch separation process or a column separation process, the iron level in grape juice could be reduced to 1 ppb with the iron(III) chelating resin. It was found that selective removal of iron was completed within 3 h.

The chelating resin did not remove other metals such as Co, Mg, Ca, Zn, Mn, K and Na in the grape juice. Mo and Cu, however, were partially removed. Preliminary microbial tests indicated that the growth of the wine yeast (Saccharomyces cerevisiae) was partially inhibited in the iron-deficient grape juice. (C) 1997 Elsevier Science B.V.

Keywords: Iron Removal, Selective Metal Separation, Grape Juice, Chelating Resins, Inhibition of Microbial Growth

White, D.A. and Bussey, R.L. (1997), Water sorption properties of clinoptilolite. *Separation and Purification Technology*, **11** (2), 137-141.

Full Text: [S\Sep Pur Tec11, 137.pdf](S/Sep%20Pur%20Tec11,%20137.pdf)

Abstract: This paper describes the preparation and testing of various ionic forms of clinoptilolite, a natural zeolite, and a study of their properties for the removal of water vapour from air. The calcium form of the zeolite showed the highest uptake of 0.127 g of water per gram of zeolite and the potassium form was the worst with a capacity of half this value. The sorption data were correlated by a ‘Langmuir’ isotherm. The size of the cation sorbed had a direct effect on the water sorption data. The results are compared with the properties of other desiccants. The zeolite uptake of water is less than that of silica gel. (C) 1997 Elsevier Science B.V.

Keywords: Natural Zeolites, Drying

Dutta, M., Baruah, R. and Dutta, N.N. (1997), Adsorption of 6-aminopenicillanic acid on activated carbon. *Separation and Purification Technology*, **12** (2), 99-108.

Full Text: [S\Sep Pur Tec12, 99.pdf](S/Sep%20Pur%20Tec12,%2099.pdf)

Abstract: The adsorption and desorption of 6-aminopenicillanic acid (6-APA) in aqueous solution has been studied using activated carbon as the adsorbent. The extent of adsorption was found to tie strongly dependent on the aqueous phase pH and this dependence could be interpreted from a model for neutral species adsorption. Desorptionstudies suggest that a small fraction of 6-APA adsorbs irreversibly on activated carbon. Adsorption equilibrium data were correlated with the Langmuir, Freundlich and Redlich-Peterson expressions with the Langmuir model being found to provide the best fit of the experimental data. The rates of adsorption and desorption appear to follow the first-order kinetics under the experimental conditions used in the study. However, more precise rate expressions requires the inclusion of the external mass transfer effect initially and the particle diffusion effect at the later stage. Adsorption enthalpy calculated from the Van’t Hoff plot was found to be 3.92 kcal mol-1. (C) 1997 Elsevier Science B.V.

Keywords: Adsorption, Adsorption Enthalpy, Activated Carbon, 6-Aminopenicillanic Acid, Langmuir Isotherm, Freundlich Isotherm, Redlich-Peterson Isotherm, Cephalosporin-C, Liquid Membrane, Antibiotics, Equilibria, Products

Lee, S.H., Vigneswaran, S. and Moon, H. (1997), Adsorption of phosphorus in saturated slag media columns. *Separation and Purification Technology*, **12** (2), 109-118.

Full Text: [S\Sep Pur Tec12, 109.pdf](S/Sep%20Pur%20Tec12,%20109.pdf)

Abstract: Adsorption of phosphorus (P as phosphates) in saturated slag media (dust and cake) columns was studied to assess the slag media’s capability in removing P from wastewater. Prior to the experiments, slag media were completely washed to rinse off the soluble metal ions which are generally responsible for forming insoluble precipitates. Experimental data revealed that the adsorption capacities of washed slag media are still much higher than that of a sandy roam soil. Two dynamic models were tested for simulating the adsorption behavior of phosphorus in columns packed with slag media. The model employing the intraparticle transport through surface diffusion is successful, while a simplified model based on the linear driving force approximation (LDFA) could not predict the column behavior properly at low concentrations, particularly on the cake slag.

Keywords: Orthogonal Collocation, Removal, Simulation, Column Adsorption, Model Simulation, Phosphorus Removal, Washed Slag Media

Díez, S., Leitão, A., Ferreira, L. and Rodrigues, A. (1998), Adsorption of phenylalanine onto polymeric resins: Equilibrium, kinetics and operation of a parametric pumping unit. *Separation and Purification Technology*, **13** (1), 25-35.

Full Text: [S\Sep Pur Tec13, 25.pdf](S/Sep%20Pur%20Tec13,%2025.pdf)

Abstract: Adsorption of D, L-Phenylalanine onto polymeric adsorbents (Amberlite XAD-4 and XAD-16, Sephabeads SP206 and SP207) was studied. Adsorption equilibrium isotherms were measured by batch equilibration at 15 and 40°C, showing the possibility of using a parametric pumping technique for aminoacid purification/recovery. Dynamic studies in a laboratory adsorption column Amicon Column (22×500 mm) were carried out to further screen adsorbents and obtain mass transfer parameters to be used in the modeling, simulation and operation of the pilot parametric pumping unit. The pilot plant includes a Amicon Columnn (90×1000 mm) and is completely automated. A package for the simulation of this cyclic operation was developed. Simulated and experimental results using Sephabeads SP206 (Mitsubishi Kasei Corporation, Japan) are in good agreement. (C) 1998 Elsevier Science B.V.

Keywords: Adsorption, Parametric Pumping, Phenylalanine, Purification, Amino-Acids, Separation, Chromatography, Adsorbents

Arévalo, E., Rendueles, M., Fernández A, Rodrigues, A. and Díaz, M. (1998), Uptake of copper and cobalt in a complexing resin: Shrinking-core model with two reaction fronts. *Separation and Purification Technology*, **13** (1), 37-46.

Full Text: [S\Sep Pur Tec13, 37.pdf](S/Sep%20Pur%20Tec13,%2037.pdf)

Abstract: The kinetics of simultaneous ion exchange of copper and cobalt with iminodiacetic chelating resins has been studied. Microscopic studies of the ion-exchange process clearly show two different reaction fronts allowing the use of shrinking-core type models. The influence of system parameters is studied both theoretically and experimentally. Experimental results obtained at different total ion concentrations for various copper-cobalt ratios and particle diameters are reasonably predicted by the shrinking-core model, allowing diffusivity calculations. (C) 1998 Elsevier Science B.V.

Keywords: Chelate Ion-Exchanger, Kinetics, Protonation

Ahmed, S., Chughtai, S. and Keane, M.A. (1998), The removal of cadmium and lead from aqueous solution by ion exchange with Na-Y zeolite. *Separation and Purification Technology*, **13** (1), 57-64.

Full Text: [S\Sep Pur Tec13, 57.pdf](S/Sep%20Pur%20Tec13,%2057.pdf)

Abstract: Lead and cadmium removal from aqueous solution by batch ion exchange with a solid Na-Y zeolite has been studied under competitive and non-competitive conditions. The extent of heavy metal (KM) removal is found to be independent of the nature of the anion, and equilibrium exchange isotherms are presented for Na-Y treatment of lead and cadmium nitrate and chloride solutions at 293 K. An increase in solution phase HM concentration lowers the affinity of the zeolite for the in-going HM ion, but lead was preferred to the indigenous sodium ion over the entire range of initial metal concentration to zeolite weight ratios (0.3-13×10-2 mol dm-3 g(z)-1) that were studied. Lead removal was much greater than that of cadmium under identical experimental conditions and Na-Y exchange efficiency is Shown to increase in the order Ni2+ < Cu2+ < Cd2+ < Pb2+. Exchange selectivity is discussed in terms of metal ion hydration and siting within the zeolite framework. A Pb/Cd/Na-Y ternary exchange isotherm was constructed from 38 pairs of experimental points, and is treated quantitatively in terms of ternary and pseudo-binary separation factors. Treatment of the lead/cadmium solutions resulted in a greater depletion (by a factor of 2) of the lead component. (C) 1998 Elsevier Science B.V.

Keywords: Cadmium, Ion Exchange, Lead, Water Treatment, Y Zeolite, Metal Co-Cation, Equilibrium Properties, Natural Zeolites, Heavy-Metals, Water, Stabilization, Systems, Copper, Soil, Zinc

Lin, Y.S. and Deng, S.G. (1998), Removal of trace sulfur dioxide from gas stream by regenerative sorption processes. *Separation and Purification Technology*, **13** (1), 65-77.

Full Text: [S\Sep Pur Tec13, 65.pdf](S/Sep%20Pur%20Tec13,%2065.pdf)

Abstract: This work compares the characteristics and SO2 removal capacity of four physical adsorbents (sillicalite, DAY zeolite, polymer and carbon) and a chemical adsorbent (CuO/gamma- Al2O3)prepared in our laboratory by a sol-gel process. SO2 sorption capacity and kinetics of CuO/gamma- Al2O3, silicalite and DAY zeolite were measured gravimetrically and compared with those of the polymer and carbon adsorbents reported in the literature. The sol-gel derived granular CuO/gamma- Al2O3 adsorbent has the characteristics of large surface area, high crush strength and attrition resistance, and good sulfation properties. Simulated SO2 breakthrough curves from a fixed-bed adsorber packed respectively with each of the five adsorbents are presented to examine the performance of these adsorbents for SO2 removal in the fixed-bed process. Among the four physical adsorbents silicalite exhibits the best properties in terms of adsorption capacity and breakthrough time. Simulated and experimental results show that a fixed-bed packed with a chemical adsorbent (CuO/gamma-Al2O3) is far more effective (with much longer breakthrough time) than that with a physical adsorbent (silicalite) for removal of trace SO2 from gas stream. (C) 1998 Elsevier Science B.V.

Keywords: Adsorption, Copper Oxide, Desulfurization, SO2 Removal, Zeolites, Flue-Gas, Sorbent Catalyst, Desulfurization, Separation, Stability, Copper

? Valsaraj, K.T., Jain, P.M., Kommalapati, R.R. and Smith, J.S. (1998), Reusable adsorbents for dilute solution separation. 1. Adsorption of phenanthrene on surfactant-modified alumina. *Separation and Purification Technology*, **13** (2), 137-145.

Full Text: [1998\Sep Pur Tec13, 137.pdf](1998/Sep%20Pur%20Tec13,%20137.pdf)

Abstract: Activated gamma-alumina surface was modified by adsorption of an anionic surfactant, sodium dodecylsulfate (SDS) from the aqueous phase. Typical S-shaped isotherms of surfactants on mineral oxides were observed for the adsorption of SDS on alumina. The formation of surfactant aggregates (hemi-micelles) on the surface made the alumina hydrophobic and increased the capacity of the oxide surface for an organic compound, namely, phenanthrene (PHE). The sorption of phenanthrene was directly related to the concentration of surfactant adsorbed. The partitioning of phenanthrene normalized to the adsorbed surfactant concentration was independent of pH. The linear sorption constant for a number of organic compounds was correlated to the octanol-water partition constant and activity coefficient in water, which are indicators of compound hydrophobicity. It is suggested that the ability to easily regenerate a modified alumina surface could be exploited in using it for wastewater treatment of contaminants at dilute concentrations. (C) 1998 Elsevier Science B.V.

Keywords: Activity, Adsorbents, Adsorption, Aggregates, Alumina, Anionic Surfactant, Aqueous Phase, Capacity, Concentration, Contaminants, Hydrophobic, Hydrophobicity, Indicators, Isotherms, Made, Mineral, Mineral Oxides, Modified, Organic, Organic Compounds, Organic-Compounds, Oxides, Partition, Partition Constant, Partitioning, pH, Phenanthrene, Separation, Sodium, Sodium Dodecylsulfate, Sorption, Surface, Surfactant, Surfactant-Modified Alumina, Surfactants, Treatment, Wastewater, Wastewater Treatment, Water

Takeuchi, Y., Hino, M., Yoshimura, Y., Otowa, T., Izuhara, H. and Nojima, T. (1999), Removal of single component chlorinated hydrocarbon vapor by activated carbon of very high surface area. *Separation and Purification Technology*, **15** (1), 79-90.

Full Text: [S\Sep Pur Tec15, 79.pdf](S/Sep%20Pur%20Tec15,%2079.pdf)

Abstract: Experimental results are reported on the application of a new type of activated carbon having very high specific surface area, 3000 m2/g, formed in granular or supported on a honeycomb board, to the recovery of chlorinated hydrocarbon solvent vapors. The activated carbon showed an excellent adsorption capacity and the type of its adsorption was found to be volume-filling. Intraparticle diffusion was found to be the same as that for conventional activated carbons, i.e. the intraparticle diffusion proceeds mostly by surface migration.

Keywords: Adsorption, Adsorption Equilibria, Breakthrough Curves, Chlorinated Hydrocarbon, Fixed-Bed Adsorption, High Surface Area Carbon, Honeycomb Shaped Carbon, *R*–ζ Method, Solvent Recovery

Hernández-Huesca, R., Díaz, L. and Aguilar-Armenta, G. (1999), Adsorption equilibria and kinetics of CO2, CH4 and N2 in natural zeolites. *Separation and Purification Technology*, **15** (2), 163-173.

Full Text: [S\Sep Pur Tec15, 163.pdf](S/Sep%20Pur%20Tec15,%20163.pdf)

Abstract: The ability of natural zeolites (ZAPS, ZNT and ZN-19) to adsorb pure CO2, CH4 and N2, was studied experimentally. The volume of CO2 adsorption in the monolayer (Langmuir) was found to be close to the micropore volume estimated by the Dubinin-Astakhov model (N2, 77 K) for all three zeolites. Considerable differences in the adsorption of CO2, CH4, and Na with these zeolites were observed, a factor that can be used for the separation of CO2-CH4 and N2-CH4 mixtures. The mechanism of activated diffusion was detected in the adsorption of CH4 with ZN-19. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Activated Diffusion, Gas Adsorption, Isosteric Heat, Sorption

Balagopal, S., Landro, T., Zecevic, S., Sutija, D., Elangovan, S. and Khandkar, A. (1999), Selective sodium removal from aqueous waste streams with NaSICON ceramics. *Separation and Purification Technology*, **15** (3), 231-237.

Full Text: [S\Sep Pur Tec15, 231.pdf](S/Sep%20Pur%20Tec15,%20231.pdf)

Abstract: Recent developments in the synthesis and application of the sodium ion conducting polycrystalline Nasicon ceramics allow for selective removal of sodium from aqueous wastes at ambient temperatures by electrochemical salt splitting. In the presence of an applied electric field, sodium ions are transported through the Nasicon structure. The size and electroneutrality constraints allow for selective transport of sodium ions, and exclude other monovalent, divalent and trivalent ions present in the impure reactants from migrating through the membrane. The sodium transport efficiency for generating pure NaOH from nitrate and sulfate industrial wastes is greater than 90%. These ceramic membranes provide the added benefit of very low parasitic losses due to absence of fouling by precipitants. Electro-osmotic transport of H2O through the membrane which is common to polymeric membrane technology is also not observed. While the initial electrochemical evaluation of the ceramic membranes showed high sodium selectivity over other metal cations, the need for improvements in sodium conductivity, long term stability, and durability in strong acid was identified. A new series of Nasicon compositions have shown considerable improvements in properties and exhibit the potential for large-scale, industrial applications. (C) 1999 Elsevier Science B.V.

Keywords: Conducting Ceramics, Nuclear Waste, Salt Splitting, Sodium Conductor

Kong, J. and Li, K. (1999), Oil removal from oil-in-water emulsions using PVDF membranes. *Separation and Purification Technology*, **16** (1), 83-93.

Full Text: [S\Sep Pur Tec16, 83.pdf](S/Sep%20Pur%20Tec16,%2083.pdf)

Abstract: A microporous hydrophobic membrane allows the permeation of an oil phase at almost zero pressure and retains the water. The separation of dilute oil-in-water mixtures using flat sheet hydrophobic PVDF membranes has been investigated using an unstirred laboratory scale semi-batch experimental system operated at 40°C. The flat sheet membranes were prepared in the laboratory by an immersion precipitation method and were characterised in terms of a mean pore radius, porosity and breakthrough pressure. The oil-in-water mixture contains 1% kerosene in distilled water. The experimental work essentially entails the study of the effects of various system parameters on the oil/water separation characteristics. In particular, the effects of feed flow rate, the operating pressure and pore size and porosity of the membrane were studied. The experimental results can be predicted reasonably well using the Hagen-Poiseuille equation at a high vertical velocity and the percentage of oil removed can be achieved as high as 77% under normal experimental conditions. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Microporous Poly(Vinylidene Fluoride) Membranes, Oil Water Separation, Phase Inversion, Separation

Dutta, M., Dutta, N.N. and Bhattacharya, K.G. (1999), Aqueous phase adsorption of certain beta-lactam antibiotics onto polymeric resins and activated carbon. *Separation and Purification Technology*, **16** (3), 213-224.

Full Text: [S\Sep Pur Tec16, 213.pdf](S/Sep%20Pur%20Tec16,%20213.pdf)

Abstract: The adsorption of certain beta-lactam antibiotics such as 7-aminocephalosporanic acid, cephalexin, cefadroxyl and 6-aminopenillanic acid in aqueous solution has been studied using polymeric resins of four different types as well as activated carbon. The adsorption intensity was found to be strongly dependent on the aqueous phase pH and this dependence could be interpreted from a model for neutral species adsorption in all cases. Adsorption equilibrium data were correlated with the Langmuir, Freundlich and Redlich-Peterson isotherm, the Langmuir model being found to provide the best fit of the experimental data. The differences in adsorption affinities of the solute obtained for the different adsorbents were interpreted from sorbent surface chemistry and morphological structure. From the correlation obtained between adsorption affinity and estimated enthalpy, it may be predicted that the adsorption is determined by a specific solute-sorbent interaction which is predominantly of enthalpic type. The adsorption rate curves for almost all the solutes appear to be typical of the first order kinetics. However, more precise kinetics will require inclusion of the external mass transfer effect initially and particle diffusion effect at a later stage. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Beta-Lactam, Langmuir Isotherm, Polymeric Resin, Cephalosporin-C, Sorbents, Equilibria, Kinetics, Products

Qiao, S. and Hu, X. (1999), Binary adsorption kinetics of ethane and propane in a large heterogeneous microporous particle. *Separation and Purification Technology*, **16** (3), 261-271.

Full Text: [S\Sep Pur Tec16, 261.pdf](S/Sep%20Pur%20Tec16,%20261.pdf)

Abstract: Sorption kinetics of ethane and propane and their binary mixtures on Norit Row activated carbon (type 0.8 supra) were investigated under various experimental conditions. The experimental kinetics data collected on a differential adsorption bed rig were employed to validate the potential of the heterogeneous macropore and surface diffusion (HMSD) model proposed by Hu and Do [X. Hu, D.D. Do, Langmuir 9 (1993) 2530]. The model takes into account the effects of surface energetic heterogeneity on both sorption kinetics and equilibrium and allows for the diffusion in both bulk and adsorbed phases. The kinetics parameters derived from single component systems were used to predict the sorption kinetics of multicomponent systems. It is found that the model can give a good description of the binary kinetics in general, and in particular, the model is able to accurately predict the overshoot degree of the rapidly diffusing/less strongly adsorbed species. Some discrepancy was also observed between the model prediction and the experimental data of desorption kinetics, and this phenomenon has been discussed. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Ethane, Kinetics, Propane, Activated Carbon, Energetic Heterogeneity, Surface-Diffusion, Gases

? Jain, P.M., Smith, J.S. and Valsaraj, K.T. (1999), Reusable adsorbents for dilute solution separation 3. Sorption dynamics of phenanthrene on surfactant-modified alumina. *Separation and Purification Technology*, **17** (1), 21-30.

Full Text: [1999\Sep Pur Tec17, 21.pdf](1999/Sep%20Pur%20Tec17,%2021.pdf)

Abstract: The formation of surfactant aggregates (hemi-micelles) on alumina substantially increased the adsorption and retarded the breakthrough of a hydrophobic organic compound (phenanthrene) in a laboratory-scale column through adsolubilization. The adsorption waves of both surfactant (sodium dodecylsulfate, SDS) and phenanthrene were predicted adequately by existing models. However, the desorption wave was not predicted satisfactorily. The maximum capacities of the alumina bed for both SDS and phenanthrene were determined and compared with batch adsorption isotherm data, the values were in good agreement. The regeneration of the alumina bed was done by adjusting the feed solution pH to higher values than during the adsolubilization step, three regeneration cycles were studied. The capacities of alumina for phenanthrene and SDS sorption were found to be the same in all three cases, indicating no significant deterioration of the alumina surface. These characteristics make the process of adsolubilization attractive for concentration of dilute aqueous waste streams. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Adsolubilization, Adsorbents, Adsorption, Adsorption Isotherm, Aggregates, Alumina, Cations, Clay, Concentration, Desorption, Dynamics, Hydrophobic, Isotherm, Models, Nonionic Organic-Compounds, Organic, pH, Phenanthrene, Regeneration, Separation, Sodium, Sodium Dodecylsulfate, Soil-Water Systems, Sorption, Streams, Surface, Surfactant, Surfactant-Modified Alumina, Tetrachloromethane Sorption, Waste, Waves

Wang, K., King, B. and Do, D.D. (1999), Rate and equilibrium studies of benzene and toluene removal by activated carbon. *Separation and Purification Technology*, **17** (1), 53-63.

Full Text: [S\Sep Pur Tec17, 53.pdf](S/Sep%20Pur%20Tec17,%2053.pdf)

Abstract: The adsorption kinetics of benzene, toluene and their binary vapor mixtures were measured on Ajar-activated carbon with a differential adsorber bed (DAB) rig and analyzed using the heterogeneous finite kinetics model [D.D. Do, K. Wang, AIChE J., 44 (1998) 68]. The size distribution of the slit-shaped micropore (MPSD) and the Lennard-Jones potential theory are employed to account for the adsorption energetic heterogeneity of the system. This MPSD is compared with the Fore size distribution (PSD) derived from high-pressure methane adsorption data with the Grand Canonical Monte Carlo (GCMC) technique. It is found that, with three mass transfer mechanisms being used to describe the uptake in activated carbon and the Maxwell-Stefan equation being used to describe the bulk phase diffusion, the finite kinetics model can fit the pure component adsorption kinetics of benzene and toluene and has the capability to simulate the multicomponent adsorption kinetics of their mixtures on Ajar-activated carbon. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption Kinetics, Aromatics, GCMC, Multicomponent, PSD, Monte-Carlo Simulation, Size Distribution, Adsorption, Diffusion, Model

Korus, I., Bodzek, M. and Loska, K. (1999), Removal of zinc and nickel ions from aqueous solutions by means of the hybrid complexation-ultrafiltration process. *Separation and Purification Technology*, **17** (2), 111-116.

Full Text: [S\Sep Pur Tec17, 111.pdf](S/Sep%20Pur%20Tec17,%20111.pdf)

Abstract: This paper presents the possibility of removing metal ions by applying the hybrid complexation-ultrafiltration process. The research was conducted on model solutions containing Zn(II) and Ni(II) ions. The complexing agent applied in the research was sodium polyacrylate, To separate the formed polymer-metal complexes, porous membranes made from polysulfone were used. Ultrafiltration of the model wastewater containing metal ions aimed at finding an optimum ratio between the concentrations of the complexing agent and metal, and determining the most favourable pH value. The ratio between polymer and metal concentrations was changed in the range 10: 1-100: 1. In the case of both examined metals, the complexation-ultrafiltration process was most effective at a 10-fold excess of the polymer with respect to the metal. The pH value was adjusted over the range 2-10 using HNO3 and NaOH solutions. An increase in alkalinity brought about an improvement in the effectiveness of the separation process. To remove metal ions from water solutions, the concentration process was carried out according to the previously determined polymer: metal ratios, and at optimum pH. The permeate obtained comprised 90% of the initial volume of the feed. The process was characterized by good effectiveness and enabled a 97-99% retention of the metal present in the feed solution. The retentate separated during the concentration process was subjected to decomplexation-ultrafiltration. High concentrations of the metals obtained in the permeates after decomplexation indicate the possibility of an effective separation of metal ions from the complexing polymer. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Complexation, Metal Ions Removal, Ultrafiltration, Heavy-Metals, Enhanced Ultrafiltration, Selective Removal, Liquid Membranes, Separation, Microfiltration, Diafiltration, Binding, Water

Hichour, M., Persin, F., Sandeaux, J. and Gavach, C. (2000), Fluoride removal from waters by Donnan dialysis. *Separation and Purification Technology*, **18** (1), 1-11.

Full Text: [S\Sep Pur Tec18, 1.pdf](S/Sep%20Pur%20Tec18,%201.pdf)

Abstract: Excess or lack of levels of fluoride in drinking water being harmful to human health, the concentration of F- ions must be maintained in the range 0.5 to 1.5 mg l-1. The purpose of this study is to apply Donnan dialysis (DD) for fluoride removal from waters with a concentration exceeding the permitted value. Two synthetic waters, which are models of waters from countries of Africa (Maghreb, Senegal), were prepared and treated with a DD pre-industrial pilot. The anion exchange membrane was the DSV membrane (Asahi Glass), with a total area of 0.176 mt. The initial fluoride concentration was 9.5 and 6.1 mg l-1 in each model water, respectively. The DD process was studied under two circulating modes of the receiver solution, single pass and batch, while the feed solution flowed continuously as a single pass. To maintain the fluoride concentration below the acceptable values at the outlet of the feed compartment, the extracted fluoride ions are complexed by Al3+ ions which were added in the receiver solution. Chemical speciation of aluminum-fluoride compounds was studied in order to define the optimized conditions of pH and concentration. Despite the different anions (Cl-, HCO3-, SO42-) and cations (Na+, K+, Ca2+, Mg2+) generally present in ground waters, a fluoride concentration in agreement with the norm (<1.5 mg l-1) could be reached whatever the water treated. However, the mineralization of water was increased by about 25% resulting from the electrolyte diffusion which occurs from the receiver to the feed solution. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Anion Exchange Membrane, Defluoridation, Donnan Dialysis, Fluoride Ion, Water, Defluoridation, Enrichment, Ash

Esalah, J.O., Weber, M.E. and Vera, J.H. (2000), Removal of lead from aqueous solutions by precipitation with sodium di-(*n*-octyl) phosphinate. *Separation and Purification Technology*, **18** (1), 25-36.

Full Text: [S\Sep Pur Tec18, 25.pdf](S/Sep%20Pur%20Tec18,%2025.pdf)

Abstract: Two organophosphorus compounds, sodium di-(n-octyl) phosphinate and sodium di-(n-dodecyl) phosphinate, were synthesized and purified. Lead was precipitated from aqueous nitrate and chloride solutions with sodium di-(n-octyl) phosphinate (NaL) in the form of PbL2(s). The effects of the feed pH. concentration of chloride, concentration of calcium, and of the chain length of the precipitating agent on the removal of lead were investigated for mole ratios of NaL to lead between 0.1 and 6.5. Adding acid to the feed solution reduced the removal of lead as some of the phosphinate precipitated in the acid form as HL(s). The removal of lead was not affected by the presence of chloride or calcium in the feed solution, up to mole ratios to lead of 250 and 2.75, respectively. The residual lead in solution was reduced by increasing the length of the alkyl group of the phosphinate to dodecyl. Over 99% of the precipitating agent was recovered by adding NaOH to the precipitate, and then contacting the solution with diethyl ether to extract the reagent. The lead was completely recovered from the PbL2(s). Lead-free precipitating agent, and an aqueous solution of lead at a concentration 100 times its concentration in the feed, were obtained. Using measured solubility products of the precipitates and literature values of the stability constants for the expected reactions, the removal of lead, the loss of precipitating agent, and the equilibrium pH were calculated. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Decontamination, Effluent Purification, Heavy Metals, Lead Removal, Waste Water Treatment, Extraction, Systems, Acids, Metals

Nosier, S.A. and Sallam, S.A. (2000), Removal of lead ions from wastewater by cementation on a gas-sparged zinc cylinder. *Separation and Purification Technology*, **18** (2), 93-101.

Full Text: [S\Sep Pur Tec18, 93.pdf](S/Sep%20Pur%20Tec18,%2093.pdf)

Abstract: Removal of lead from wastewater consisting of lead nitrate by cementation on a gas-sparged zinc rod was investigated experimentally. Detailed observations were made for the deposited lead by scanning electron microscope (SEM) to show the porosity and nodular structure of the lead deposit. The activation energy for the process was found to be 10 kcal/g.mol. The rate controlling step was found to be diffusion of lead ion through a solution boundary layer surrounding the zinc cylinder. Accordingly, rates of cementation were expressed in terms of the mass transfer coefficient. Variables studied were initial lead ion concentration, length of the zinc cylinder, temperature and N2 flow rate. Increasing the height of the zinc cylinder was found to decrease the mass transfer coefficient. The experimental data were correlated by the equation:

J = 0.195+0.55(Fr.Re)(-0.109)(L/d)(-0.5).

Keywords: Cementation, Gas Sparging, Heavy Metals, Mass Transfer Coefficient, Zinc Cylinder

Gupta, V.K. and Ali, I. (2000), Utilisation of bagasse fly ash (a sugar industry waste) for the removal of copper and zinc from wastewater. *Separation and Purification Technology*, **18** (2), 131-140.

Full Text: [S\Sep Pur Tec18, 131.pdf](S/Sep%20Pur%20Tec18,%20131.pdf)

Abstract: Bagasse fly ash, a waste produced in sugar industries, has been converted into an inexpensive and effective adsorbent. The product was characterised by different chemical and physical methods and has been used for the removal of copper and zinc from wastewater. Various parameters such as pH, adsorbent dose, initial metal ions concentrations, temperature, particle size, etc. were optimised. Copper and zinc are adsorbed by the developed adsorbent up to 90/95% in batch and column experiments. The adsorption was found to be endothermic in nature and follows both the Langmuir and Freundlich models. Isotherms have been used to evaluate thermodynamic parameters for the adsorption process.

Keywords: Blast-Furnace Waste, Low-Cost Adsorbent, Activated Slag, Equilibrium Uptake, Sorption Dynamics, Column Operations, Earth Elements, Water, Adsorption, Cadmium, Adsorbent, Adsorption, Bagasse Fly Ash and Metal Ions, Copper, Wastewater, Zinc

Karabulut, S., Karabakan, A., Denizli, A. and Yurum, Y. (2000), Batch removal of copper(II) and zinc(II) from aqueous solutions with low-rank Turkish coals. *Separation and Purification Technology*, **18** (3), 177-184.

Full Text: [S\Sep Pur Tec18, 177.pdf](S/Sep%20Pur%20Tec18,%20177.pdf)

Abstract: The removal of heavy-metal ions from aqueous solutions containing low-to-moderate levels of contamination using Turkish Beypazari low-rank coal was investigated. Carboxylic acid and phenolic hydroxyl functional groups present on the coal surface were the adsorption site to remove metal ions from solution via ion exchange. The equilibrium pH of the coal/solution mixture has been shown to be the principal factor controlling the extent of removal of Cu(II) and Zn(II) ions from aqueous solutions. The optimum pH was measured to be 4.0 and it was found that the adsorption reached equilibrium in 20 min. The maximum adsorption capacities of the metal ions from their single solutions were 1.62 mgfor Cu(II) and 1.20 mgfor Zn(II) per g of coal. The order of affinity based on a weight uptake by coal was as follows: Cu(II) > Zn(II). The same behavior was observed during the competitive adsorption, that is in the case of adsorption from their binary solutions. The adsorption phenomena appeared to follow a typical Langmuir isotherm. It was observed that use of low-rank coal was considerably effective in removing Cu(II) and Zn(II) ions from aqueous solutions. Higher amounts of adsorbed metal ions could be desorbed (up to 80%) using 25 mM EDTA. Low-rank Turkish coals are suitable for consecutive use for more than three cycles without significant loss of adsorption capacity.

Keywords: Metal-Ions, Activated Carbons, Amidoxime Groups, Adsorption, Water, Preconcentration, Separation, Recovery, Sorption, Clay, Turkish low-rank coal, metal ions, adsorption

Smičiklas, I.D., Milonjić, S.K., Pfendt, P. and Raičević, S. (2000), The point of zero charge and sorption of cadmium(II) and strontium(II) ions on synthetic hydroxyapatite. *Separation and Purification Technology*, **18** (3), 185-194.

Full Text: [S\Sep Pur Tec18, 185.pdf](S/Sep%20Pur%20Tec18,%20185.pdf)

Abstract: Surface properties of synthetic well-crystallized hydroxyapatite were investigated. Points of zero charge (pHPZC) for different solid to solution ratios were determined by the batch equilibration technique, using KNO3 as a background electrolyte. It has been found that the decrease in solid to solution ratio from 1: 100 to 1: 500 leads to a decrease in pHPZC from 6.1 to 4.1, respectively. Sorption of Cd2+ ions is not influenced by the initial pH value in the investigated range (5-7), while sorption of Sr2+-ions, determined in the wider pH range (4.5-11.5), depends only on the initial pH higher than 10, i.e. final pH values higher than 4.5. Negative surface charge established when pH of the solution is higher than pH, leads to a more effective cation sorption. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Hydroxyapatite, Point of Zero Charge, Sorption, Cd2+-and Sr2+-Ions, Aqueous-Solutions, Lead Immobilization, Chromatography, Apatite, Removal

Khan, A.R., Riazi, M.R. and Al-Roomi, Y.A. (2000), A thermodynamic model for liquid adsorption isotherms. *Separation and Purification Technology*, **18** (3), 237-250.

Full Text: [S\Sep Pur Tec18, 237.pdf](S/Sep%20Pur%20Tec18,%20237.pdf)

Abstract: Based on the principle of solution thermodynamics for liquid-solid equilibrium, a simple mathematical expression has been developed to express liquid adsorption isotherms. A weight fraction based activity coefficient model has been derived for the solid phase nonideality. The proposed model has been evaluated and compared with four other models commonly used for liquid adsorption isotherms in the literature. Systems used in this study are solute adsorption from dilute aqueous solution on various activated carbon or molecular sieve. For 14 systems at various isotherms for the temperature range 0.1-75°C and the solute concentration range of 5-26540 g/m3 for 382 data points, the proposed model predicts equilibrium concentration with an average deviation of 6%. The proposed model clearly outperforms other available methods such as vacancy solution theory, exponential model and various other modified forms of the Freundlich isotherm. The unique features of the proposed model are its simplicity, generality and accuracy over the entrie experimental concentration and temperature ranges. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Liquid Adsorption Isotherm, Thermodynamic Model, Liquid-Solid Equilibrium, Solid Activity Coefficient, Dilute Aqueous-Solution, Activated Carbon, Equation, Pollutants

Hashim, M.A., Tan, H.N. and Chu, K.H. (2000), Immobilized marine algal biomass for multiple cycles of copper adsorption and desorption. *Separation and Purification Technology*, **19** (1-2), 39-42.

Full Text: [S\Sep Pur Tec19, 39.pdf](S/Sep%20Pur%20Tec19,%2039.pdf)

Abstract: The biomass of a marine alga, Sargassum baccularia, was immobilized by using polyvinyl alcohol as the polymeric matrix. The reusability of the immobilized biomass was studied by using copper as the model metal ion in five consecutive cycles of adsorption-desorption. Hydrochloric acid at pH 1.0 and ethylenediaminetetraacetic acid (EDTA) solution at 2 mM were used as the desorbing agents. Both desorbents were effective in stripping the adsorbed copper from the immobilized biomass over the five cycles. However, copper uptake in Cycles 2-5 was lower than that in Cycle 1, indicating that the two desorbing agents limited the reuse potential of the immobilized biomass in multiple cycles of adsorption-desorption.

Keywords: Removal, Microorganisms, Accumulation, Biosorption, Alginate, Recovery, Cells, Immobilized, Algal, Copper, Adsorption, Desorption

Cheung, C.W., Porter, J.F. and McKay, G. (2000), Sorption kinetics for the removal of copper and zinc from effluents using bone char. *Separation and Purification Technology*, **19** (1-2), 55-64.

Full Text: [S\Sep Pur Tec19, 55.pdf](S/Sep%20Pur%20Tec19,%2055.pdf)

Abstract: The removal of copper and zinc ions from aqueous effluents by bone char has been studied in single component sorption systems. The sorption capacity of bone char for copper and zinc is 0.75 and 0.53 mmol per g bone char, respectively. The values indicate that bone char is a suitable sorbent for the two metal ions. The equilibrium isotherms are best described by a Langmuir-Freundlich (L-F) type isotherm equation. The kinetics of sorption of the two metal ions have been analyzed by two kinetic models, namely, the Lagergren pseudo first-order model and the Elovich kinetic model. Kinetic analysis of the two models has been carried out for system variables-initial metal ion concentration and mass of bone char. The rate constants for the two models have been determined and the correlation coefficients have been calculated in order to assess which model provides the best fit predicted data with experimental results. The Elovich equation provides the best fit to experimental data.

Keywords: Bone Char, Elovich, Equilibrium, Kinetics, Pseudo First-Order, Sphagnum Moss Peat, Activated Carbon, Aqueous-Solution, Adsorption, Models, Waters, Ions, Lead

Chen, J.P. and Wang, X.Y. (2000), Removing copper, zinc, and lead ion by granular activated carbon in pretreated fixed-bed columns. *Separation and Purification Technology*, **19** (3), 157-167.

Full Text: [S\Sep Pur Tec19, 157.pdf](S/Sep%20Pur%20Tec19,%20157.pdf)

Abstract: Adsorption experiments by pretreated fixed-bed columns for single-species (Cu, Zn, and Pb) and multi-species (Cu-Zn, Cu-Pb, and Cu-Pb-Zn) metal ions were carried out in this study. It was demonstrated that the breakthrough occurred more slowly with an increasing influent pH and a decreasing flow rate. An increase in ionic strength slightly increased copper removal, but it did not affect zinc removal. Experiments on competitive adsorption illustrated that the removal of metal ions was decreased when additional metal ions were added. The effect was more signifcant for zinc as the activated carbon was less favourable for its removal. The removal of these three metal ions by the activated carbon columns followed the descending order: Cu > Pb > Zn. Copper and zinc removal was increased significantly when EDTA was added to the influent. At the same time, the removal of copper was almost the same as that of zinc. An increase in ionic strength caused a decrease in the removal of copper and zinc ions complexed with EDTA. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Granular Activated Carbon, Metal Ions, Fixed-Bed Columns, Pretreatment, Breakthrough, Adsorption, Equilibrium, Cadmium

Yao, C.C. (2000), Extended and improved Langmuir equation for correlating adsorption equilibrium data. *Separation and Purification Technology*, **19** (3), 237-242.

Full Text: [S\Sep Pur Tec19, 237.pdf](S/Sep%20Pur%20Tec19,%20237.pdf)

Abstract: The Langmuir adsorption isotherm equation is extended to include a third parameter. The extended Langmuir model is then compared with the Langmuir, the Langmuir-Freundlich and the Tóth models in their ability to fit experimental data. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption Equilibrium Model, Langmuir Equation, Data Correlation, Carbon

Figueiredo, S.A., Boaventura, R.A. and Loureiro, J.M. (2000), Color removal with natural adsorbents: Modeling, simulation and experimental. *Separation and Purification Technology*, **20** (1), 129-141.

Full Text: [S\Sep Pur Tec20, 129.pdf](S/Sep%20Pur%20Tec20,%20129.pdf)

Abstract: The adsorption in some natural materials containing chitin namely, Squid (Loligo vulgaris) and Sepia (Sepia officinalis) pens, and Anodonta (Anodonta cygnea) shells for color removal from textile wastewaters was studied. A reactive and a direct green dyestuff, the Cibacron green T3G-E (CI reactive green 12) and the Solophenyl green BLE 155% (CI direct green 26) from CIBA, respectively, were selected for this study. Continuous experiments in a packed column at 20°C with the natural materials showed a large internal resistance to mass transfer. In order to improve the adsorbents performances, the materials were submitted to chemical treatment (demineralization and/or deproteinization). Isotherms at 20°C were determined for all systems and compared with the ones using the materials after chemical treatment. These results were fitted by both Langmuir and Freundlich models. The determined parameters showed that equilibrium adsorption capacities increased at least five times. These results and the mathematical simulation of the column runs showed that there are improvements both in equilibrium and kinetic data. The adsorbents physical and chemical properties before and after chemical treatment were briefly characterized in order to investigate the changes responsible for those improvements. Biodegradation of the direct dyestuff was observed during the column operation using both the Anodonta shell and Sepia pen. For these two systems the chemical treatment of the materials did not improve the color removal. Biodegradation was included in the developed model and the influence of the model parameters on the system behavior was analyzed. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Natural Adsorbents, Color Removal, Textile Dyestuffs, Modeling and Simulation, Biodegradation, Chitosan Fibers, Adsorption, Chitin, Dyes, Diffusion

Wang, K., Qiao, S. and Hu, X. (2000), On the performance of HIAST and IAST in the prediction of multicomponent adsorption equilibrium. *Separation and Purification Technology*, **20**, 243-249.

Full Text: [S\Sep Pur Tec20, 243.pdf](S/Sep%20Pur%20Tec20,%20243.pdf)

Abstract: The performance of the heterogenous ideal absorbed solution theory (HIAST) using a uniform energy distribution and the global ideal adsorbed solution theory (IAST) is studied on their predictability f multicomponent adsorption equilibria along with experimental data of gases on two activated carbons. Results show that HIAST may not always provide better predictability than IAST if the energy distribution parameters are not properly chosen, although it is reported in the literature that in most cases HIAST is superior to IAST. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption equilibrium, Multicomponent, IAST, HIAST

? Yuan, Q.Z., Jain, P.M. and Valsaraj, K.T. (2000), Reusable adsorbents for dilute solution separation. 4: Adsorption of 1,2 dichlorobenzene and phenanthrene on a surfactant-modified semiconductor (titania) surface. *Separation and Purification Technology*, **21** (1-2), 9-16.

Full Text: [2000\Sep Pur Tec21, 9.pdf](2000/Sep%20Pur%20Tec21,%209.pdf)

Abstract: The surface of a semi-conducting surface, viz., titania was modified by adsorbing an anionic surfactant, viz., sodium dodecyl sulfate (SDS) at aqueous pH values less than the point of zero charge of 6.8. The hydrophobic titania surface was capable of adsorbing hydrophobic organic compounds, such as 1,2-dichlorobenzene and phenanthrene at dilute concentrations from the aqueous phase. The adsorption partition coefficients for both compounds on SDS hemi-micelles on TiO2 are of magnitudes similar to their octanol-water partition constants, which are indicators of similar hydrophobic environments. The potential uses of SDS-coated TiO2 for simultaneously adsorbing and photo-chemically degrading hydrophobic organic compounds as a means of treating dilute wastewater streams are suggested. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Anionic Surfactant, Aqueous Phase, Dioxide, Heterogeneous Photocatalysis, Hydrophobic, Hydrophobic Organic Compounds, Indicators, Modified, Modified Alumina, Organic, Organic Compounds, Partition, Partition Coefficients, Partition Constant, pH, pH Values, Photo-Catalysis, Semi-Conductor, Separation, Sodium, Sodium Dodecyl Sulfate, Streams, Sulfate, Surface, Surfactant, Surfactant-Modified Surface, TiO2, Titania, Wastewater, Water, Zero Charge

Aksu, Z. and Akpinar, D. (2000), Modelling of simultaneous biosorption of phenol and nickel(II) onto dried aerobic activated sludge. *Separation and Purification Technology*, **21** (1-2), 87-99.

Full Text: [S\Sep Pur Tec21, 87.pdf](S/Sep%20Pur%20Tec21,%2087.pdf)

Abstract: The equilibrium uptake of phenol and nickel(II) ions, both singly and in combination, by dried aerobic activated sludge was studied in a batch system. From the previous studies, the optimum biosorption pH values were determined as 4.5 for nickel(II) and as 1.0 for phenol. Adsorption isotherms were developed for both the single-and dual-component systems at these two pH values and expressed by the mono-and multi-component Langmuir, Freundlich and Redlich-Peterson adsorption models and model parameters were estimated by the non-linear regression method. It was seen that the mono-component adsorption equilibrium data fitted very well to the Redlich-Peterson model for both the components and for both the pH values while all the multi-component adsorption models adequately predicted the multi-component adsorption equilibrium data at moderate ranges of concentration. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Simultaneous Biosorption, Phenol, Nickel(II), Dried Aerobic Activated Sludge, Mono-and Multi-Component Adsorption Models, Multicomponent Adsorption-Isotherms, *Chlorella-Vulgaris*, Organic Pollutants, Chromium(VI), Mixtures, Biomass, Metals, Ions

Banat, F., Al-Asheh, S. and Mohai, F. (2000), Batch zinc removal from aqueous solution using dried animal bones. *Separation and Purification Technology*, **21** (1-2), 155-164.

Full Text: [S\Sep Pur Tec21, 155.pdf](S/Sep%20Pur%20Tec21,%20155.pdf)

Abstract: The effectiveness of animal bones (AB) to adsorb zinc from aqueous solution was studied. Batch kinetics and isotherm studies were carried out to investigate the effect of contact time, initial concentration of the adsorbate, particle size, temperature, pH, and the addition of salt (NaCl) on this adsorption process. It was noted that an increase in the zinc concentration, temperature, and initial pH of the metal solution resulted in an increase in the metal uptake per unit weight of the sorbent. The decrease in the particle size of the sorbent resulted in an increase in the metal uptake per unit weight of the sorbent. The concentration of salt in the metal solution showed significant influence on the zinc ion sorption by the sorbent. Freundlich and Langmuir isotherm models were found to be applicable for the experimental data of Zn2+ sorption by AB. Desorption of metals from pre-loaded AB with zinc ions was carried out with different acid eluants and it was found that H2SO4 is the most effective desorbent. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Sorption, Zinc, Animal Bones, Desorption, Ion-Exchange, Adsorption, Vulgaris, Cadmium, Copper, Moss, Lead

Denizli, A., Say, R. and Arica, Y. (2000), Removal of heavy metal ions from aquatic solutions by membrane chromatography. *Separation and Purification Technology*, **21** (1-2), 181-190.

Full Text: [S\Sep Pur Tec21, 181.pdf](S/Sep%20Pur%20Tec21,%20181.pdf)

Abstract: Polyvinylalcohol membranes were prepared by a solvent casting technique. Metal-complexation ligand, i.e. monochlorotriazinyl-dye Cibacron Blue F3GA was then attached. These membranes with a high water content of 119%, and containing 8.7 mmol Cibacron Blue F3GA/m2 were used in the adsorption/stripping of some selected heavy metal ions [Cu(II), Hg(II), Pb(II) and Cd(II)] from aquatic solutions containing varying initial concentration of metal ions. Adsorption rates were very high, and equilibrium was achieved in about 10 min. The non-specific adsorption of heavy metal ions on the plain membranes was low [0.63 mmol/m2 for Cu(II), 0.75 mmol/m2 for Hg(II), 0.94 mmol/m2 for Pb(II) and 1.22 mmol/m2 for Cd(II)]. The maximum adsorptions of heavy metal ions onto the Cibacron Blue F3GA-attached affinity membranes for non-competitive conditions were 16.9 mmol/m2 for Hg(II), 19.2 mmol/m2 for Cu(II), 25.8 mmol/m2 for Pb(II), 32.4 mmol/m2 for Cd(II). The observed order in adsorption was found to be Cd(II) > Pb(II) > Cu(II) > Hg(II). Different behavior was observed for competitive adsorption. The order of affinity was Cu(II) > Cd(II) > Hg(II) > Pb(II). Regeneration of polyvinylalcohol membranes was done by using 0.1 M HNO3 in 30 min. Heavy metal ions could be repeatedly adsorbed and stripped without significant decrease in adsorption capacity. The experimental data of adsorption from solutions containing metal ions were found to correlate well with Langmuir isotherm equation. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Affinity Membranes, Microporous, Porous Membranes, Water Treatment, Povinyl Alcohol, Cibacron Blue F3GA, Chromatography, Liquid Membranes, Separation, Transport, Recovery, Adsorption, Extraction, Sorption, Zinc

Dutta, S., Basu, J.K. and Ghar, R.N. (2001), Studies on adsorption of p-nitrophenol on charred saw-dust. *Separation and Purification Technology*, **21** (3), 227-235.

Full Text: [S\Sep Pur Tec21, 227.pdf](S/Sep%20Pur%20Tec21,%20227.pdf)

Abstract: An effective adsorbent developed from common sawdust has been used for the removal of p-nitrophenol from aqueous solution. It is observed that the degree of agitation has a significant effect on the rate of removal of p-nitrophenol. Higher initial concentration and lower temperature are more favorable for the adsorption of p-nitrophenol. The experimental results confirmed that the intraparticle diffusion has a hindering effect on the adsorption rate. An external mass-transfer model has been applied to interpret the rate data. The values of fluid- particle mass-transfer coefficient obtained from the experimental data have been compared with the predicted value. The mass-transfer coefficient is found to decrease with increasing concentration of p-nitrophenol. Adsorption equilibrium data fit most satisfactorily with the Langmuir adsorption isotherm. (C) 2001 Elsevier Science B.V. All rights reserved

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherm, Dyes, Equilibrium, Intraparticle Diffusion, Mass Transfer, Mass Transfer Coefficient, Mass-Transfer Coefficient, P-Nitrophenol, Phenol, Rates, Removal, Sawdust, Stirrer Speed, Waste

Pereira, P.R., Pires, J. and de Carvalho, M.B. (2001), Adsorption of methane and ethane in zirconium oxide pillared clays. *Separation and Purification Technology*, **21** (3), 237-246.

Full Text: [S\Sep Pur Tec21, 237.pdf](S/Sep%20Pur%20Tec21,%20237.pdf)

Abstract: In zirconium oxide pillared clays (A(BET) similar to 266 m2 g-1), prepared with clays from different sources, the adsorption of pure methane and ethane, the more abundant hydrocarbon components of natural gas, were determined in the temperature range between 215 and 293 K up to the atmospheric pressure. The Langmuir model and the vacancy solution theory (VST) of Suwanayuen and Danner were used to fit the experimental data. As expected, the VST model leads to a better adjustment. The parameters obtained with this model were used to predict the binary adsorption isotherms. The data Predicted for mixtures were consistent with the experimental results obtained in the same volumetric apparatus used for the adsorption of pure components, analysing by gas chromatography the evolution of the fluid phase until the attainment of equilibrium. The results reveal a higher affinity towards ethane. The equilibrium selectivity towards ethane decreases when temperature and pressure increase, ranging from more than 100, at the lowest temperatures and pressures studied, to 3-4 near ambient temperature and atmospheric pressure. Even in the latter, less favourable situation, which in fact corresponds to the more usual working conditions, the phase diagram, predicted by the VST model indicates that the studied zirconium pillared clays are promising materials for ethane/methane separation. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Methane, Ethane, Zirconium Oxide, Pillared Clays, Vacancy Solution Theory, Carbon-Dioxide, Gas-Adsorption, Zeolites, Mixtures, Propane, Equilibrium, Separation, Isotherms, Catalysts

Notes: highly cited

Aksu, Z. (2001), Equilibrium and kinetic modelling of cadmium(II) biosorption by *C. Vulgaris* in a batch system: Effect of temperature. *Separation and Purification Technology*, **21** (3), 285-294.

Full Text: [S\Sep Pur Tec21, 285.pdf](S/Sep%20Pur%20Tec21,%20285.pdf)

Abstract: The biosorption of cadmium(II) ions to *C. Vulgaris* studied in a batch system with respect to the temperature, initial pH and initial metal ion concentration. The algal biomass exhibited the highest cadmium(II) uptake capacity at 20°C, at the initial pH value of 4.0 and at the initial cadmium(II) ion concentration of 200 mg l-1. Biosorption capacity decreased from 85.3 to 51.2 mg g-1 with an increase in temperature from 20 to 50°C at this initial cadmium(II) concentration. Freundlich and Langmuir isotherm models were tried to represent the equilibrium data of cadmium(II) biosorption depending on temperature. Equilibrium data fitted very well to both the models in the studied concentration range of cadmium(II) ions at all the temperatures studied. The pseudo first-and pseudo second-order kinetic models were also applied to experimental data assuming that the external mass transfer limitations in the system can be neglected and biosorption is sorption controlled. The results showed that cadmium(II) uptake process followed the second-order rate expression and adsorption rate constants decreased with increasing temperature. Using the second-order kinetic constants, the activation energy of biosorption was also evaluated. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Rate, Batch System, Binding, Biomass, Biosorption, C.Vulgaris, Cadmium(II), Cadmium(II) Ions, Capacity, Cell-Walls, Chlorella-Vulgaris, Copper, Equilibrium, Experimental, Expression, First, First Order, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Modelling, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Lead(II) Ions, Marine-Algae, Mass Transfer, Metal, Metal-Ions, Modelling, Models, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Constants, Rights, Second Order, Second-Order, Sorption, Temperature

? Gomes, C.P., Almeida, M.F. and Loureiro, J.M. (2001), Gold recovery with ion exchange used resins. *Separation and Purification Technology*, **24** (1-2), 35-57.

Full Text: [2001\Sep Pur Tec24, 35.pdf](2001/Sep%20Pur%20Tec24,%2035.pdf)

Abstract: In this paper one strong acidic, one strong basic and one weak basic ion-exchange resins, considered as exhausted in an industrial demineralizing plant, are screened for gold recovery from cyanide solutions. Based on the observed ability for the recovery and on the ease of regeneration, the weak base anion exchanger Purolite A-100 is selected. This spent resin is stable until 60°C and, after regeneration, conserves its physical properties as compared with a new one. Equilibrium data for the resin are determined, proving the very high capacity of the resin for gold (~500 mg Au/g dry resin) and modeled by the Freundlich and mass action isotherm models. A kinetic experiment is conducted in a batch adsorber and modeled with an equivalent Fick’s diffusivity using the linear driving force approximation, showing that the film resistance to mass transfer controls the operation. Finally, a fixed bed adsorber is saturated with gold aurocyanide and regenerated with a potassium hydroxide solution. The model used for the simulation of both steps incorporates axial dispersion and the same equivalence for the ionic diffusivity. During the elution process, precipitation of dihydrated potassium aurocyanide occurs inside the resin, increasing the intraparticle resistance to mass transfer. The model is able to reasonably represent the experimental elution results when a large internal resistance to mass transfer is used. A 25-fold concentration of the initial gold solution is obtained in this saturation/elution process, albeit the precipitation, showing the feasibility of the method for the recovery of gold, increasing the useful life of the resins and decreasing pollution. The anionic Purolite A-100 resin showed also a significant capacity for removing silver, although less than for gold, probably because silver cyanide complexes occupy, on the average, more than one ion exchange site in the resin.

Keywords: Gold Recovery, Spent Resins, Ion Exchange, Ion Diffusivity, Mass Transfer

Snukiškis, J. and Kaušpėdienė, D. (2001), Kinetics of the combined sorption of copper(II) and nonionic surfactant by carboxylic acrylcationic exchanger. *Separation and Purification Technology*, **24** (1-2), 59-65.

Full Text: [S\Sep Pur Tec24, 59.pdf](S/Sep%20Pur%20Tec24,%2059.pdf)

Abstract: Kinetics of the simultaneous sorption of nonionic surfactant alkylmonoethers (ALM-10) and copper(II) cations by the hydrogen-containing form of Purolite C106 carboxylic acrylcationic exchanger has been investigated considering the possibility to control the concentration of both copper(II) and the surfactant in sewage effluents: kinetic curves were measured. coefficients of intraparticle diffusion (D) and external mass transfer diffusion (beta) calculated. On increasing the acidity from pH 5 to 3 both the rate of intraparticle diffusion and the equilibrium sorption of copper(II) decrease but the corresponding parameters for ALM-10 increase. The action of copper(II) leads to an increase in the rate of ALM-10 intraparticle diffusion but results to a decrease in ALM-10 equilibrium sorption. Combined sorption of nonionic surfactant and copper(II) by hydrogen-containing form of Purolite C106 can be applicable for the purification of sewage including copper plating rinsewater from both contaminants simultaneously: accordingly to the coefficients of intraparticle diffusion for both copper(IT) and the surfactant, the sorber filled with Purolite C106 would not limit the productivity if integrated into the system of sewage purification by ion exchangers. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Cation Exchanger, Copper(II), Nonionic Surfactants, Sorption, Ion-Exchange, Adsorption

Raichur, A.M. and Basu, M.J. (2001), Adsorption of fluoride onto mixed rare earth oxides. *Separation and Purification Technology*, **24** (1-2), 121-127.

Full Text: [S\Sep Pur Tec24, 121.pdf](S/Sep%20Pur%20Tec24,%20121.pdf)

Abstract: Fluoride pollution of water is widespread in several parts of India. Fluoride although beneficial to humans in small quantities, causes dental fluorosis when consumed in larger quantities over a period of time. In the present study a novel adsorbent was used to remove fluoride from synthetic solutions. The adsorbent, which is a mixture of rare earth oxides, was found to adsorb fluoride rapidly and effectively. The effect of various parameters such as contact time. initial concentration, pH. and adsorbent dose on adsorption efficiency was investigated. More than 90% of the adsorption occurred within the first 5 - 10 min. Adsorption efficiency was found to be dependent on the initial fluoride concentration and adsorption behavior followed Langmuir adsorption model. The optimum pH was found to be about 6.5. The presence of other ions such as nitrate and sulphate did not affect the adsorption of fluoride significantly (adsorption efficiency reduced from 85 to 79%) indicating the selective nature of the adsorbent. The adsorbed fluoride could be easily desorbed by washing the adsorbent with a pH 12 solution. This study clearly shows the applicability of naturally occurring rare earth oxides as selective adsorbent for fluoride from solutions. (C) 2001 Elsevier Science BN. All rights reserved.

Keywords: Fluoride, Adsorption, Rare Earth Oxide, Anion, Desorption, Aqueous-Solution, Removal, Water

McGrellis, S., Serafini, J.N., JeanJean, J., Pastol, J.L. and Fedoroff, M. (2001), Influence of the sorption protocol on the uptake of cadmium ions in calcium hydroxyapatite. *Separation and Purification Technology*, **24** (1-2), 129-138.

Full Text: [S\Sep Pur Tec24, 129.pdf](S/Sep%20Pur%20Tec24,%20129.pdf)

Abstract: The maximum uptake of cadmium ions from aqueous solution by sorption on calcium hydroxyapatite was measured in different experimental conditions. A ‘slow introduction process’ leads to a larger uptake than for standard batch experiments. The main differences are: a larger incorporation of Cd in the crystal framework of apatite through a substitution -diffusion process, a different distribution among Ca(1) and Ca(2) sites and a lower concentration gradient. For the larger Cd concentration, a dissolution -precipitation also appears. leading to the formation of cadmium hydrogenophosphate, but the formation of this solid phase remains a minor process, The results also confirmed that sorption of cadmium ions on calcium hydroxyapatites does not achieve equilibrium in standard experimental laboratory time intervals. The higher achieved uptake is particularly attractive for the practical use of apatites in the decontamination of solutions polluted by cadmium. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Hydroxyapatites, Cadmium, Sorption, Decontamination, Inorganic Cation-Exchangers, Synthetic Hydroxyapatites, Solid-Solutions, Cd2+

Pal, O.R. and Vanjara, A.K. (2001), Removal of malathion and butachlor from aqueous solution by clays and organoclays. *Separation and Purification Technology*, **24** (1-2), 167-172.

Full Text: [S\Sep Pur Tec24, 167.pdf](S/Sep%20Pur%20Tec24,%20167.pdf)

Abstract: Adsorption of malathion and butachlor onto kaolin. montmorillonite. bentonite clays and respective organoclays were studied, Organoclays were prepared by the exchange of quaternary ammonium type surfactants such as tetradecyltrimethyl ammonium bromide (TTAB), dodecyltrimethylammonium bromide (DTAB), and cetylpyridinium chloride (CPC) for inorganic cations like Na+ and Ca2+ on internal and external surface of the clays. This modification produces a change of surface property of clay from hydrophilic to hydrophobic. The adsorption equilibrium data points were fitted to Freundlich isotherm equations. The adsorption of malathion and butachlor were significantly enhanced by surfactant treatment of the clays. The amount of both pesticides adsorbed per unit mass of organoclay followed the order of TTA-kaolin < TTA-montmorillonite < TTA-bentonite, which is inconsistent with the organic carbon content of the clays. The removal efficiency of organomontmorillonite to treat malathion is in the order of CP(C-16)-montmorillonite > TTA(C-14)-montmorillonite > DTA(C-12)-montmorillonite. Butachlor is adsorbed to greater extent than malathion by each adsorbent. which may be due to the higher hydrophobicity of butachlor, indicating considerable hydrophobic interaction between adsorbent/radsorbate system. These findings may find applications in the removal of sparingly water soluble pesticides from aquifers. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Clays, Organoclays, Pesticides, Water Treatment, Activated Bentonite, Water

Ricordel, S., Taha, S., Cisse, I. and Dorange, G. (2001), Heavy metals removal by adsorption onto peanut husks carbon: Characterization, kinetic study and modeling. *Separation and Purification Technology*, **24** (3), 389-401.

Full Text: [S\Sep Pur Tec24, 389.pdf](S/Sep%20Pur%20Tec24,%20389.pdf)

Abstract: Carbon prepared from peanut husks (PHC) has been used for the adsorption of Pb2+, Zn2+, Ni2+ and Cd2+, over a range of initial metal ion concentration (0.15 mM). Chemical and physical characteristics of PHC were determined. The effects of particle size and of carbon doses were evaluated by batch experiments. The kinetics of sorption were followed, based on the amounts of metal sorbed at various time intervals. The modeling of kinetic and isotherm curves has also been investigated. The rate constant and the reaction order have been calculated. The results show that Pb2+ has best affinity to PHC than Cd2+, Ni2+, Zn2+. From these results an order of the sorption capacity of metal ions sorbed was derived. (C) 2001 Elsevier Science BN. All rights reserved.

Keywords: Heavy Metals, Kinetic Adsorption, Peanut Husks, Characterization, Modeling, Blast-Furnace Sludge, Activated Carbon, Aqueous-Solution, Hull Carbon, Lead Ions, Cadmium, Sorption, Oxidation, Oxygen

Kadirvelu, K., Thamaraiselvi, K. and Namasivayam, C. (2001), Adsorption of nickel(II) from aqueous solution onto activated carbon prepared from coirpith. *Separation and Purification Technology*, **24** (3), 497-505.

Full Text: [S\Sep Pur Tec24, 497.pdf](S/Sep%20Pur%20Tec24,%20497.pdf)

Abstract: Activated carbon has been prepared from coirpith by chemical activation and characterized. Carbonised coirpith is able to adsorb Ni(II) from aqueous solution. It was noted that a decreasing in the carbon concentration with constant Ni concentration, or an increase in the Ni concentration with constant carbon concentration resulted in a higher nickel uptake per unit weight of carbon. The Langmuir and Freundlich models for dynamics of metal ion uptake proposed in this work fit the experimental data reasonably well. The adsorption capacity (Q0) calculated from Langmuir isotherm was 62.5 mg Ni(II) g-1 at initial pH of 5.0 at 30 degreesC for the particle size 250-500 µm. The adsorption of Ni increased with pH from 2 to 7 and remained constant upto 10. The recovery of Ni(II) after adsorption can be carried out by treatment of the Ni loaded carbon with HCL Desorption studies confirms adsorption is ion exchange. As coirpith is discarded as waste material from coir processing industries, the carbon is expected to be economical product for metal ion remediation from water and wastewater. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Carbonization, Adsorption, Adsorption Isotherms, Heavy-Metal Ions, Waste-Water, By-Product, Agricultural Waste, Removal, Adsorbent, Sorption, Hulls

Monser, L. and Adhoum, N. (2002), Modified activated carbon for the removal of copper, zinc, chromium and cyanide from wastewater. *Separation and Purification Technology*, **26** (2-3), 137-146.

Full Text: [S\Sep Pur Tec26, 137.pdf](S/Sep%20Pur%20Tec26,%20137.pdf)

Abstract: Modified activated carbon are carbonaceous adsorbents which have tetrabutyl ammonium iodide (TBAI) and sodium diethyl dithiocarbamate (SDDC) immobilised at their surface, This study investigates the adsorption of toxic ions, copper, zinc, chromium and cyanide on these adsorbents that have undergone surface modification with tetrabutyl ammonium (TBA) and SDDC in wastewater applications. The modification technique enhance the removal capacity of carbon and therefore decreases cost-effective removal of Cu(II), Zn(II), Cr(VI) and CN- from metal finishing (electroplating unit) wastewater. Two separate fixed bed modified activated carbon columns were used, TBA-carbon column for cyanide removal and SDDC-carbon column for multi-species metal ions (Cu, Zn, Cr) removal. Wastewater from electroplating unit containing 37 mg l-1 Cu, 27 mg l-1 Zn, 9.5 mg l-1 Cr and 40 mg l-1 CN- was treated through the modified columns. A total CN- removal was achieved when using the TBA-carbon column with a removal capacity of 29.2 mg g-1 carbon. The TBA-carbon adsorbent was found to have an effective removal capacity of approximately five times that of plain carbon. Using SDDC-carbon column, Cu, Zn and Cr metal ions were eliminated with a removal capacity of 38, 9.9 and 6.84 mg g-1, respectively. The SDDC-carbon column has an effective removal capacity for Cu (four times), Zn (four times) and Cr (two times) greater than plain carbon. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Modification, Fixed Bed Columns, Metal Finishing Wastewater, Aqueous-Solution, Adsorption, Lead, Fish

Çengeloğlu, Y., Kir, E. and Ersöz, M. (2002), Removal of fluoride from aqueous solution by using red mud. *Separation and Purification Technology*, **28** (1), 81-86.

Full Text: [S\Sep Pur Tec28, 81.pdf](S/Sep%20Pur%20Tec28,%2081.pdf)

Abstract: The removal of fluoride from aqueous solution by using the original and activated red mud forms was studied in batch equilibration technique. Influence of pH. adsorbent dose and contact time on the adsorption were investigated. The fluoride adsorption capacity of activated form was found to be higher than that of the original form. The maximum removal of fluoride ion was obtained at pH 5.5. The removal of fluoride was expressed with Langmuir and Freundlich isotherms. Langmuir adsorption isotherm Curve was found to be significant. It was found that the sufficient time for adsorption equilibrium of fluoride ions is 2 h. The possibility of removal of fluoride ion by using red mud is explained on the basis of the chemical nature and specific interaction with metal oxide surfaces and the results are interpreted in terms of pH variations. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Red Mud, Adsorption, Removal of Fluoride, Utilization, Donnan Dialysis, Ion-Exchange, Adsorption, Waters

Abusafa, A. and Yücel, H. (2002), Removal of 137Cs from aqueous solutions using different cationic forms of a natural zeolite: Clinoptilolite. *Separation and Purification Technology*, **28** (2), 103-116.

Full Text: [S\Sep Pur Tec28, 103.pdf](S/Sep%20Pur%20Tec28,%20103.pdf)

Abstract: Distribution coefficients of cesium on natural and cation-enriched (Na+, K+, NH4+ and Ca+2) forms of clinoptilolite were measured by batch, radioactive tracer technique. The measurements were carried out for an initial cesium concentration range of 10-6-10-1 mol/dm3 and at temperatures of 25, 40, 60 and 80 degreesC. Experimental isotherms evaluated from distribution coefficients were fit to Langmuir, Freundlich and Dubinin-Radushkevich (D-R)models. of the models tested, D-R model was found to represent the isotherms better in a wider range of concentrations than either Langmuir or Freundlich model. Breakthrough behavior of cesium on natural and cation-enriched forms of clinoptilolite for a particular set of conditions were also determined in a small size column. Column parameters were evaluated using mass transfer zone concept. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Clinoptilolite, Cesium, Sorption Isotherm, Dubinin-Radushkevich Isotherm, Adsorption, Exchange, Soil

? Matsumoto, M., Shimizu, T. and Kondo, K. (2002), Selective adsorption of glucose on novel chitosan gel modified by phenylboronate. *Separation and Purification Technology*, **29** (3), 229-233.

Full Text: [2002\Sep Pur Tec29, 229.pdf](2002/Sep%20Pur%20Tec29,%20229.pdf)

Abstract: Novel gels from phenylboronate derivatives of chitosan were prepared for the adsorption of saccharides. Two chitosan gels were used: one modified by phenylboronate via Schiff’s base formation (A) and one in which phenylboronate was introduced by amide formation (B). The adsorption characteristics Of D-glucose and 1-methyl-alpha-D-glucoside on these gels were examined and compared with a commercial gel. Though both chitosan gels were inferior to the commercial gel in their adsorption capacity, the chitosan gel (A) showed a much higher selectivity of D-glucose to 1-methyl-alpha-D-glucoside in comparison to the commercial gel. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Boric-Acid, Capacity, Chitosan, Gel, Glucose, Modified, Resin, Saccharides, Selectivity

Métivier-Pignon, H., Faur-Brasquet, C. and Le Cloirec, P. (2003), Adsorption of dyes onto activated carbon cloths: approach of adsorption mechanisms and coupling of ACC with ultrafiltration to treat coloured wastewaters. *Separation and Purification Technology*, **31** (1), 3-11.

Full Text: [S\Sep Pur Tec31, 3.pdf](S/Sep%20Pur%20Tec31,%203.pdf)

Abstract: Recent absorbents, activated carbon cloths (ACCs) are used to absorb dyes. First, adsorption is carried out in batch reactors, initial kinetic coefficients and adsorption capacities are determined, thanks to adsorption kinetics and isotherms. Twenty-two dyes are tested and two ACCs are used, one exclusively microporous, the other being partially mesoporous. With the view to understanding the absorption process of dyes onto ACCs, quantitative structure–activity relationships are developed using molecular connectivity indices as dyes descriptions. The statistical tool introduced is the multiple linear regression. Then, the ability of ACC to treat coloured wastewater is assessed by coupling adsorption with ultrafiltration. First, both processes are operated step after step. The membrane filtration step (3000 Da molecular weight cut-off) allows a great removal of turbidity (>98%), whereas adsorption onto ACC provides the decolourization of the stream with an adsorption capacity in continuous flow reactor of 180 mg g-1 of the acid orange 7. Secondly, ultrafiltration and adsorption onto ACC are operated continuously. When the breakthrough is reached, a total volume of 101 l is successfully discoloured, with a permeate flow rate higher than 20 l m-2 h-1.

Keywords: Adsorption, Activated Carbon Cloth, Dyes, Quantitative Structure–Activity Relationship, Ultrafiltration

Hu, Z.H., Lei, L., Li, Y.J. and Ni, Y.M. (2003), Chromium adsorption on high-performance activated carbons from aqueous solution. *Separation and Purification Technology*, **31** (1), 13-18.

Full Text: [S\Sep Pur Tec31, 13.pdf](S/Sep%20Pur%20Tec31,%2013.pdf)

Abstract: The adsorption of Cr(VI) from aqueous solutions by commercial and lab-made high surface area (HSA)-activated carbons was investigated. Physiochemical factors such as equilibrium time, temperature and solution pH that affect the magnitude of Cr(VI) adsorption were studied. The HSA-activated carbons showed high performance for Cr removal, and their adsorption capacity is several times larger than that of commercial carbons. Both micropores and mesopores have important contribution on the adsorption. However, desorption is more dependent on the mesoporosity of activated carbons. Therefore, regeneration is easier for the carbon with high mesoporosity. As a result, the adsorption capacity of mesoporous carbon could be recovered over 97%, whereas 54% for highly microporous carbon.

Keywords: Activated Carbon, Chromium, Adsorption, Regeneration, Wastewater

? Orthman, J., Zhu, H.Y. and Lu, G.Q. (2003), Use of anion clay hydrotalcite to remove coloured organics from aqueous solutions. *Separation and Purification Technology*, **31** (1), 53-59.

Full Text: [2003\Sep Pur Tec31, 53.pdf](2003/Sep%20Pur%20Tec31,%2053.pdf)

Abstract: Anion clay hydrotalcite sorbents were prepared to investigate their adsorption capabilities in the removal of coloured organic substances from various aqueous systems. Anion clay hydrotalcite was found to be particularly effective at removing negatively charged species. Its excellent uptake levels of anionic species can be accounted for by its high surface area and anion exchange ability. That is, coloured substances can be adsorbed on the surface or enter the interlayer region of the clay by anion exchange. In the adsorption of Acid Blue 29 on the anion clay hydrotalcite, an equilibrium time of 1 h with dye removal exceeding 99% was obtained. The hydrotalcite was found to have an adsorption capacity marginally below that of commercial activated carbon. It should be noted that the spent sorbents can be regenerated easily by heating at 723 K to remove all adsorbed organics. The reused sorbents displayed greater adsorption capabilities than the newly prepared hydrotalcite. Hence, the anion clay hydrotalcite is easily recoverable and reusable such that it is a promising sorbent for environmental and purification purposes.

Keywords: Anion Clay, Hydrotalcite, Ion Exchange, Coloured Organics, Environmental Purification, Regeneration

? Chakraborty, S., Purkait, M.K., DasGupta, S., De, S. and Basu, J.K. (2003), Nanofiltration of textile plant effluent for color removal and reduction in COD. *Separation and Purification Technology*, **31** (2), 141-151.

Full Text: [2003\Sep Pur Tec31, 141.pdf](2003/Sep%20Pur%20Tec31,%20141.pdf)

Abstract: A membrane based separation process (nanofiltration, NF) is used to treat the effluent from a textile plant. The dye mixture contains reactive black dye (Cibacron Black B) and reactive red dye (Cibacron Red RB). An organic membrane with molecular weight cut-off of 400 is used for the experiments. The experiments are conducted in an unstirred batch and a rectangular cross flow cell. Separations with retentions up to 94 and 92% of the two dyes are achieved respectively in the cross flow cell where steady state is attained quickly. It is important to note that NF techniques achieve a sharp reduction in chemical oxygen demand (COD), (up to 94% in cross flow cell), as the dyes are removed from the permeate. A parametric study of the separation process is undertaken to characterize the effects of the operating variables, e.g., trans-membrane pressure, dye concentration in the feed and cross flow velocity in case of cross flow NF. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Nanofiltration, Cross Flow, Textile Effluent, Dye, Chemical Oxygen Demand, Flux Decline, Water, Dyes

? Malik, P.K. and Saha, S.K. (2003), Oxidation of direct dyes with hydrogen peroxide using ferrous ion as catalyst. *Separation and Purification Technology*, **31** (3), 241-250.

Full Text: [2003\Sep Pur Tec31, 241.pdf](2003/Sep%20Pur%20Tec31,%20241.pdf)

Abstract: The oxidative degradation of two direct dyes, Blue 2B (B54) and Red 12B (R31) in aqueous solution has been studied using Fenton’s reagent (Fe2+ and H2O2). Results show that dyes are decomposed in a two-stage reaction. In the first stage. dyes are decomposed rapidly, and somewhat less rapidly in the second stage. The effects of different system variables like initial pH of the medium, initial concentrations of the dye, Fe2+ and H2O2, reaction temperature, and added Cl- and SO42- ions have been investigated. The degradation rate is strongly dependent on the initial concentrations of the dye, Fe2+ and H2O2. The results indicate that the B54 and R31 can be most effectively oxidised in an aqueous medium of pH 3 at an initial [Fe2+]:[H2O2]:[dye] ratio of 1:32.9:2.4 and 1:16.5:1.8 (mM), respectively. At the optimum initial ratio of [Fe2+]:[H2O2]:[dye], 97% degradation can be achieved in 30 min at a temperature of 30°C, and 70% removal of initial chemical oxygen demand (COD) is achieved after 60 min. The degradation of both the dyes obeys first order rate kinetics with respect to the concentration of the dye in the second stage of oxidation. The results will be useful in designing wastewater treatment plants. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Fenton’s Reagent, Direct Dye, Oxidation, Ferrous Ion, Hydrogen Peroxide, Wastewater, Fenton-Like Reaction, Waste-Water, Chemical Oxidation, Biological Treatment, Contaminated Soils, Aqueous-Solutions, Reagent, Degradation, Electrode

Al-Asheh, S., Banat, F. and Abu-Aitah, L. (2003), Adsorption of phenol using different types of activated bentonites. *Separation and Purification Technology*, **33** (1), 1-10.

Full Text: [S\Sep Pur Tec28, 1.pdf](S/Sep%20Pur%20Tec28,%201.pdf)

Abstract: Naturally occurring bentonite is able to adsorb phenol from aqueous solutions. Sodium-treated bentonite underwent several activation methods before its exposure to the phenol solution. It was treated with cetyltrimethyl ammonium bromide (CTAB) as a cationic surfactant, with aluminum-hydroxypolycation as a pillaring agent and a combination of the two (CATB/Al-Bentonite). The Na-bentonite was also physically treated in an oven operated at 850 °C. Batch adsorption tests were carried out to remove phenol from aqueous solution using the above-mentioned bentonites. It was found that the amount of phenol removal was seriated in the following order: CTAB/Al-Bentonite>Al-Bentonite>CTAB bentonite>thermal-treated bentonite>cyclohexane-treated bentonite>natural bentonite. X-ray diffraction analysis showed that an increase in the microscopic platelets of bentonite when treated with CTAB was the reason behind the highest uptake of phenol. The increase in sorbent concentration or initial pH values of the solutions resulted in more phenol removal from the solution. The increase in temperature decreased phenol uptake by the bentonites used in this work. The Freundlich isotherm model was employed and well represented the experimental data.

Keywords: Adsorption, Phenol, Bentonite, CTAB, Al-Bentonite, Thermal Bentonite, Freundlich Model

Li, Q.B., Wu, S.T., Liu, G., Liao, X.K., Deng, X., Sun, D.H., Hu, Y.L. and Huang, Y.L. (2004), Simultaneous biosorption of cadmium(II) and lead(II) ions by pretreated biomass of Phanerochaete chrysosporium. *Separation and Purification Technology*, **34** (1-3), 135-142.

Full Text: [S\Sep Pur Tec34, 135.pdf](S/Sep%20Pur%20Tec34,%20135.pdf)

Abstract: The article extends the study on the treatment of heavy metal wastewater by considering the competitive biosorption of two metal ions together, Cd(II) and Pb(II), by Phanerochaete chrysosporium, a filamentous fungus, under optimum biosorption conditions determined for each metal ion. The effects of the presence of one metal ion on the biosorption of the other metal ion were investigated in terms of equilibrium isotherm and adsorption yield. Experimental results indicated that the uptake capacity and adsorption yield of one metal ion were reduced by the presence of the other metal ion. In addition, comparisons between biosorption of Pb(II) ions and Cd(II) ions by the biomass of P. chrysosporium in the binary solution could lead to the conclusion that biosorption of Pb(II) ions was preferential to that of Cd(II) ions. In the single-ion situation, biosorption of Cd(II) ions and Pb(II) ions had the optimum adsorption conditions in common, which were the solution pH 4.5, temperature 27 °C. The maximum uptake obtained at initial concentration of Cd(II) ions 50 mg l−1, could reach 15.2 mg g−1, for Pb(II) ions it could reach 12.34 mg g−1. Both the adsorption equilibrium data fitted the Freundlich model well. Moreover, the uptake of Cd(II) ions had a less sensitive dependence on temperature than that of Pb(II) ions.

Keywords: Binary Ions Adsorption, Heavy Metals, Fine-Chemical, Wastewater, Fungus

Kandah, M.I. (2004), Zinc and cadmium adsorption on low-grade phosphate. *Separation and Purification Technology*, **35** (1), 61-70.

Full Text: [S\Sep Pur Tec35, 61.pdf](S/Sep%20Pur%20Tec35,%2061.pdf)

Abstract: An attempt was made to utilize low-grade phosphate (LGP) as an adsorbent for Zn2+ and Cd2+ over a range of initial metal ions concentrations (10–50 ppm), agitation time (5–210 min), adsorbent concentration (1–7 g/l) and pH (2–6). Adsorption of both Zn2+ and Cd2+ increased with increased LGP concentration and reached maximum uptake at 5 g/l and pH between 4 and 6 for both metal ions. The amount adsorbed increases with time and initial metal concentrations for both metal ions. The equilibrium time was achieved for both metal ions after 30 min. The process of uptake obeys both the Langmuir and Freundlich isotherms. The affinity of LGP for H+ is considerably higher than for Zn2+ and Cd2+. The equilibrium uptake of zinc ions decreases with the increase in the initial cadmium ions concentration and that of cadmium ions decreases as the initial zinc ions concentration increases. Desorption of LGP with 0.1 N H2SO4 was done for three cycles successfully.

Keywords: Low-Grade Phosphate, Zinc, Cadmium, Adsorption

Aksu, Z. and Kabasakal, E. (2004), Batch adsorption of 2,4-dichlorophenoxy-acetic acid (2,4-D) from aqueous solution by granular activated carbon. *Separation and Purification Technology*, **35** (3), 223-240.

Full Text: [S\Sep Pur Tec35, 223.pdf](S/Sep%20Pur%20Tec35,%20223.pdf)

Abstract: Adsorption equilibrium, kinetics and thermodynamics of 2,4-dichlorophenoxy-acetic acid (2,4-d), one of the most commonly used phenoxy acid herbicides, onto granular activated carbon were studied in aqueous solution in a batch system with respect to pH, temperature and initial 2,4-d concentration. At 600 mg l-1 initial 2,4-d concentration activated carbon exhibited the highest 2,4-d uptake capacity of 518.0 mg g-1 at 45 °C and at an initial pH value of 2.0. Freundlich, Langmuir, Redlich-Peterson and Koble-Corrigan isotherm models were applied to experimental equilibrium data of 2,4-d adsorption depending on temperature. Equilibrium data fitted very well to the Freundlich and Koble-Corrigan equilibrium models in the studied concentration range of 2,4-d at all the temperatures studied. Some simple mass transfer and kinetic models were applied to the experimental data to examine the mechanisms of adsorption and potential rate controlling steps such as external mass transfer, intraparticle diffusion and adsorption process. It was found that both the boundary layer and intraparticle diffusion played important roles in the adsorption mechanisms of 2,4-d, and adsorption kinetics followed a pseudo first-order kinetic model rather than pseudo second-order and saturation type kinetic models for all temperatures studied. The activation energy of adsorption (EA) was determined as 8.46 kJ mol-1 using the Arrhenius equation. Using the thermodynamic equilibrium coefficients obtained at different temperatures, the thermodynamic constants of adsorption (ΔG°, ΔH° and ΔS°) were also evaluated.

Keywords: Adsorption, 2,4-d, Granular Activated Carbon, Equilibrium, Kinetics, Thermodynamic, Batch System

Yildiz, E. (2004), Phosphate removal from water by fly ash using crossflow microfiltration. *Separation and Purification Technology*, **35** (3), 241-252.

Full Text: [S\Sep Pur Tec35, 241.pdf](S/Sep%20Pur%20Tec35,%20241.pdf)

Abstract: Removal of phosphate ions (PO4-P) from aqueous solution by means of fly ash was investigated in a crossflow microfiltration system. Batch experiments prior to membrane filtration were conducted to determine PO4-P removal capacity of the fly ash. The effect of PO4-P concentration, initial pH of solution and the fly ash dosage on the PO4-P removal was studied. It was found that if the initial pH of solution is about 6, maximum PO4-P removal is obtained and as the fly ash dosage increase the percentage of PO4-P removal rises due to an increase in solubility of calcium ions and final pH in water. In membrane filtration, PO4-P treated with the fly ash was separated from water with crossflow microfiltration technique. The effect of the fly ash dosage, PO4-P concentration, transmembrane pressure drop (DeltaP) and membrane type on the membrane fluxes (J\*) and PO4-P rejections (R-p\*) were investigated. Under certain conditions, 100% R\* could be achieved depending on the fly ash dosage. It was seen that J\* and R\* increase with increasing of the dosage. When the concentration Of PO4-P in the feed solution is increased, R\* reduces because of the low final pH and inadequate calcium ion concentration. Furthermore, it was also found that results obtained for J\* and R\* were better for cellulose nitrate (CN) membranes compared with cellulose acetate (CA) membranes. The effect of transmembrane pressure drop (DeltaP), the fly ash dosage and PO4-P concentration on steady state permeate fluxes and rejections have been explained by specific cake resistances (alpha). It has been seen that separation of insoluble PO4-P compounds by crossflow membrane filtration seems to be advantageous to classical batch separation in respect of efficiency. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Crossflow Filtration, Microfiltration, Phosphate Removal, Fly Ash, Flux Decline, Aqueous-Solutions, Heavy-Metals, Waste-Water, Filtration, Adsorption, Bagasse

Inan, H., Dimoglo, A., Şimşek, H. and Karpuzcu, A. (2004), Olive oil mill wastewater treatment by means of electro-coagulation. *Separation and Purification Technology*, **36** (1), 23-31.

Full Text: [S\Sep Pur Tec36, 23.pdf](S/Sep%20Pur%20Tec36,%2023.pdf)

Abstract: The removal of chemical oxygen demand (COD), color and suspended solid (SS) from olive oil mill wastewater (OMWW) was experimentally investigated by using electro-coagulation (EC). Aluminum and iron were used in the reactor simultaneously as materials for electrodes. The reactor voltage was 12 V, current density (CD) was changing between 10 and 40 mA cm-2, pH was taken equal to 4, 6, 7, and 9 units, and duration varied in the limits of 2-30 min. Under the 30-min retention time, 52% COD was removed by the aluminum anode and 42% was removed by the iron anode. CD efficiency versus the percent of COD removal was examined at the 10-min retention time for pH 6.2±10.2. It appeared that with the CD increase, the percent of COD removal was increasing as well. The color removal yield was examined as the result of using different retention times, current densities, and iron and aluminum as materials for anodes. CD values in the range of 10-40 mA cm-2 were tested at the 10-min retention time each one, color removal was 90-97% by this. In this study the EC process was examined with the aim of determining the highest rate of SS removal from the OMWW as well. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Analysis, Carbonate, CO2, Composition, Diffusion, Equilibrium, Exchange-Reaction, Gases, Isotherms, Kinetics, Li2ZrO3, Lithium Zirconate, Materials, Mechanism, Membranes, Model, Modified, Oxygen, Permeation, Potassium, Properties, Range, Rate Limiting, Reaction, Solid State Reaction, Sorption, Sorption Mechanism, Sorption Properties, Synthesis, Temperature, Thermodynamics

Sarvinder Singh, T. and Pant, K.K. (2004), Equilibrium, kinetics and thermodynamic studies for adsorption of As(III) on activated alumina. *Separation and Purification Technology*, **36** (2), 139-147.

Full Text: [S\Sep Pur Tec36, 139.pdf](S/Sep%20Pur%20Tec36,%20139.pdf)

Abstract: Contamination of drinking water due to arsenic is a severe health hazard problem. Most of the techniques developed for pentavalent arsenic [As(V)] species are not very effective for trivalent arsenic ions [As(III)] which are more toxic and mobile than arsenate ions. Present investigation aims to remove arsenite ions [As(III)] by activated alumina. Effect of adsorbent dose, solution pH, and contact time has been investigated. Kinetics reveal that uptake of As(III) ion is very rapid in the first 6 h and equilibrium time is independent of initial As(III) concentration. The arsenite removal was strongly dependent on pH and temperature. Equilibrium studies show that As(III) ions have high affinity towards activated alumina at pH 7.6. Both Freundlich and Langmuir adsorption isotherms were well fit to the experimental data. Thermodynamic parameters depict the exothermic nature of adsorption and the process is spontaneous and favorable. The results suggest that activated alumina can be used effectively for the removal of A(III) ions.

Keywords: Adsorption, Arsenite, Equilibrium, Adsorption Kinetics, Activated Alumina

Zhang, D.H., Kodama, A., Goto, M. and Hirose, T. (2004), Kinetics in hydrogen isotopes cryogenic adsorption. *Separation and Purification Technology*, **37** (1), 1-8.

Full Text: [S\Sep Pur Tec37, 1.pdf](S/Sep%20Pur%20Tec37,%201.pdf)

Abstract: The adsorption isotherms of hydrogen and deuterium in a helium carrier gas at 77 K were obtained, using the molecular sieve 5A as adsorbents in a fixed column. The binary adsorption isotherms were extended from the single ones. The kinetic model was built for simulation of the concentration distribution for single and binary in inert helium carrier gas, and compared with the experimental results. Some parameters in the model were considered and examined experimentally.

Keywords: Cryogenic Adsorption, Hydrogen Isotopes, Mass Transfer Coefficient, Molecular Sieve 5A, Adsorption Isotherm

Biškup, B. and Subotić, B. (2004), Kinetic analysis of the exchange processes between sodium ions from zeolite A and cadmium, copper and nickel ions from solutions. *Separation and Purification Technology*, **37** (1), 17-31.

Full Text: [S\Sep Pur Tec37, 17.pdf](S/Sep%20Pur%20Tec37,%2017.pdf)

Abstract: Kinetics of exchange processes between the sodium ions from zeolite A and cadmium, copper and nickel ions from solutions were determined by measuring the changes in the concentrations of Me2+ (Me2+ = Cd2+, Cu2+ and Ni2+) and sodium ions in both zeolite and the liquid phase during the exchange processes. The exchange kinetics were analyzed in accordance with the existing models, namely that diffusion and chemical reaction may be the rate-determining steps. Analyses have shown that chemical exchange is possible rate-determining step of the exchange process. Hence, the exchange kinetics were additionally analyzed in accordance with the kinetic model derived on the basis of the second order forward reaction between the Me2+ ions from solution and sodium ions from zeolite A, and the second order backward reaction between sodium ions from solution and Me2+ ions from zeolite A. Satisfactory agreement between the measured exchange kinetics and the exchange kinetics calculated by numerical solutions of the model equations, show that the exchange process takes place in accordance with the proposed model, i.e. by the second order forward and backward chemical reactions. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Zeolite A, Ion Exchange Kinetics, Heavy Metals Cations, Available Synthetic Zeolites, Self-Diffusion, Natural Zeolites, Cation-Exchange, Heavy-Metals, Waste-Water, Thin-Layers, Y-Zeolites, Na+ Ions, Removal

Çulfaz, M. and Yağız, M. (2004), Ion exchange properties of natural clinoptilolite: Lead-sodium and cadmium-sodium equilibria. *Separation and Purification Technology*, **37** (2), 93-105.

Full Text: [S\Sep Pur Tec37, 93.pdf](S/Sep%20Pur%20Tec37,%2093.pdf)

Abstract: In the present work. ion exchange of lead and cadmium on the sodium form of Western Anatolia clinoptilolite is examined at 25 degreesC and 0.1 total normality. Its total theoretical cation exchange capacity was 2.3 meq, g. But only the sodium was exchanged during the equilibrium experiments. On this basis, the theoretical exchange capacity is 1.74 meq, g. According to the equilibrium studies, the selectivity sequence can be given as Pb2+ > Na+ > Cd2+. The maximum exchange levels expressed as the percentage of the theoretical exchange capacity were 100% for lead and 54% for cadmium. Using the equilibrium data, the thermodynamic analysis of the system was carried out. The solution non-ideality Correction factor has almost no effect on the Kielland plot and so on the numerical values of the thermodynamic equilibrium constant. The thermodynamic equilibrium constant (K,) and the standard free energy of exchange (DeltaGdegrees) were calculated as 16.6 and -3.48 kJ, eq. for lead-sodium system, and 0.16 and +2.27 kJ, eq. for cadmium-sodium system, respectively. Comparing the results of the present work with the data in literature, it can be concluded that the ion exchange capacities and cation selectivities of clinoptilolites with different cationic compositions are different. So, one should carry out cation exchange experiments on representative samples from the deposit before using it as cation exchanger for any practical application. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Cadmium, Cd2+, Clinoptilolite, Cu2+, Ferrierite, Heavy-Metals, Ion Exchange, Lead, Mordenite, Pb2+, Removal, Selectivity, Waste-Water, Zeolites

Notes: highly cited

Guibal, E. (2004), Interactions of metal ions with chitosan-based sorbents: A review. *Separation and Purification Technology*, **38** (1), 43-74.

Full Text: [S\Sep Pur Tec38, 43.pdf](S/Sep%20Pur%20Tec38,%2043.pdf)

Abstract: Metal cations can be adsorbed by chelation on amine groups of chitosan in near neutral solutions. In the case of metal anions, the sorption proceeds by electrostatic attraction on protonated amine groups in acidic solutions. However, the presence of ligands and the pH strongly control sorption performance (sorption isotherm) and the uptake mechanism (changing the speciation of the metal may result in turning the chelation mechanism into the electrostatic attraction mechanism). Several examples are discussed with precious metals (Pd, Pt), oxo-anions (Mo, V) and heavy metals (Cu, Ag). Sorption performance (equilibrium uptake but also kinetics) is also strictly controlled by other structural parameters of the polymer (degree of deacetylation, crystallinity for example) that control swelling and diffusion properties of chitosan. The identification of the limiting steps of the sorption process helps in designing new derivatives of chitosan. Diffusion properties may be improved by physical modification of chitosan (manufacturing gel beads, decreasing crystallinity). Selectivity can be enhanced by chemical modification (grafting, for example, sulfur compounds). Several examples are discussed to demonstrate the versatility of the material. This versatility allows the polymer to be used under different forms (from water soluble form, to solid form, gels, fibers, hollow fibers...) for polymer-enhanced ultrafiltration and sorption processes. These interactions of metal ions with chitosan can be used for the decontamination of effluents, for the recovery of valuable metals but also for the development of new materials or new processes involving metal-loaded chitosan. Several examples are cited in the design of new sorbing materials, the development of chitosan-supported catalysts, the manufacturing of new materials for opto-electronic applications or agriculture (plant disease treatment...). (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Chitosan, Ultrafiltration, Sorption, Kinetics, Isotherms, Diffusion, Cross-Linked Chitosan, Chemically-Modified Chitosan, Partially Deacetylated Chitin, Supported Palladium Catalyst, Highly Phosphorylated Derivatives, Chiral Stationary Phases, N-Carboxymethyl Chitosan, Gel Beads, Heavy-Metals, Aqueous-Solutions

Sèbe, G., Pardon, P., Pichavant, F., Grelier, S. and De Jéso, B. (2004), An investigation into the use of eelgrass (*Zostera noltii*) for removal of cupric ions from dilute aqueous solutions. *Separation and Purification Technology*, **38** (2), 121-127.

Full Text: [S\Sep Pur Tec38, 121.pdf](S/Sep%20Pur%20Tec38,%20121.pdf)

Abstract: The ability of eelgrass (Zostera noltii (ZN)) to retain cupric ions from dilute aqueous solutions was studied as a function of pH, contact time and initial metal/sorbent ratio. Copper removal increased with pH, the optimum efficiency being attained between pH 5.5 and 6. When compared with other local lignocellulosic materials such as wood and corncob, Z. noltii appeared to be three times more effective than maritime pine and twice more than corncob. The presence of carboxyl groups in eelgrass was evidenced by infrared spectroscopy and photometric titration. These groups were found to participate in the adsorption process through cation exchange mechanisms, though other active binding sites were shown to be also involved. The metal and eelgrass relative concentrations appeared to influence the sorption capacity: the adsorption capacity of Z. noltii increased from 0.31 to 0.76 mmol Cu per gram as the metal/sorbent ratio increased. This behavior was partly explained by a change in the stoichiometry of a number of complexes as the metal and eelgrass relative concentrations varied. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Copper, Copper Adsorption, Decontamination, Eelgrass, Ion Exchange, Lignocellulosic, Metal-Ions, Model, Modified Barks, Recovery, Synthetic Solutions, Waste, Wood, Wood Preservatives

Krishna, M.V.B., Rao, S.V., Arunachalam, J., Murali, M.S., Kumar, S. and Manchanda, V.K. (2004), Removal of 137Cs and 90Sr from actual low level radioactive waste solutions using moss as a phyto-sorbent. *Separation and Purification Technology*, **38** (2), 149-161.

Full Text: [S\Sep Pur Tec38, 149.pdf](S/Sep%20Pur%20Tec38,%20149.pdf)

Abstract: Moss (Funaria hygrometrica) used as phyto-sorbent, was evaluated for its potential for the removal of 137Cs and 90Sr from actual low level radioactive waste (LLW) solutions. Laboratory batch experiments with moss were carried out to determine optimal binding pH, exposure time and binding capacity for Cs and Sr binding. These studies indicated that sorbent showed high affinity for both Cs and Sr at pH range 5-9. Time dependence experiments showed a rapid adsorption of Cs and Sr within first 10 min of contact. Maximum sorption capacity for moss was found to be similar to6 mg/g (Cs), similar to 14 mg/g (Sr) and for NaOH treated moss capacity was found to be similar to17 mg/g (Cs) and 38 mg/g (Sr). In addition desorption experiments were carried out to recover the metal ions after sorption. The presence of complementary cations Na+, K+, Ca2+, Mg2+ and Al3+ at high concentrations suppressed the sorption of Cs and Sr on treated moss. Chemical esterification experiments indicate that carboxyl groups are mainly involved in the binding of Cs and Sr from LLW solutions. These findings show that the use of moss as phyto-sorbent may be a viable alternative, for the removal of Cs and Sr from LLW solutions. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Moss, Phyto-Sorbent, Radio Cs, Radio Sr, Low-Level Radioactive Waste, Aqueous-Solutions, Radionuclides, Pollution, Cesium, Resins

? Zhai, Y., Wei, X., Zeng, G., Zhang, D. and Chu, K. (2004), Study of adsorbent derived from sewage sludge for the removal of Cd2+, Ni2+ in aqueous solutions. *Separation and Purification Technology*, **38** (2), 191-196.

Full Text: [2004\Sep Pur Tec38, 191.pdf](2004/Sep%20Pur%20Tec38,%20191.pdf)

Abstract: The adsorbent derived from sewage sludge through chemical pyrolysis has been used for the adsorption of Cd2+ and Ni2+ from aqueous solution. Parameters such as the agitation time, metal ion concentration, adsorbent dosage and pH were studied. The adsorption data fit well with the Langmuir and Freundlich isotherm models. The capacity of adsorption calculated from the Langmuir isotherm was 16.9 mg/g for Cd2+ and Ni2+, respectively at the initial pH of 5.8 at 25 °C. And the agitation time of 60 min was necessary for the adsorption to reach equilibrium, the optimum pH value in the range of 5.5–6.0. Desorption studies were performed with dilute hydrochloric acid. Quantitative recovery of the metal ion is possible. The mechanism of adsorption seems to be ion exchange. As the sewage sludge is discarded as waste from wastewater treatment processing, the adsorbent derived from sewage sludge is expected to be an economical product for metal ion remediation from water and wastewater.

Keywords: Adsorbent, Sewage Sludge, Adsorption, Metal Ions, Adsorption Isotherm

Farajzadeh, M.A. and Monji, A.B. (2004), Adsorption characteristics of wheat bran towards heavy metal cations. *Separation and Purification Technology*, **38** (3), 197-207.

Full Text: [S\Sep Pur Tec38, 197.pdf](S/Sep%20Pur%20Tec38,%20197.pdf)

Abstract: Different-metal complexing ligands carrying synthetic and natural adsorbents have been reported in the literature for heavy metals removal. We have developed a new approach to obtain relatively high adsorption capacity utilizing wheat bran as a natural metal adsorbent. Adsorption equilibrium was achieved in about 10 min for all studied cations. The adsorption capacities are 93 mg/g for Cr(III), 70 mg/g for Hg(II), 62 mg/g for Pb(II), 21 mg/g for Cd(II), 15 mg/g for Cu(II) and 12 mg/g for Ni(II). The obtained results are an indication of higher specificity of the wheat bran for heavy metal cations compared with sodium and potassium ions. More than 82% of studied cations, except Ni(II), were removed from aqueous solution in single step. Matrix effect was not observed in most real samples in adsorption of cations by the studied sorbent. In this study no attempts were done in order to determine a mechanism for cations removal by the wheat bran, but it seems that complex mechanisms including ion exchange, complexation and size exclusion are possible. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Modified Wheat Bran, Heavy Metals, Adsorption, Wastewater, Natural Byproduct, Excellent Sorbent, Aqueous-Media, Rice Bran, Carcinogenesis, Sorption, Removal

Dubray, A. and Vanderschuren, J. (2004), Mass transfer phenomena during sorption of hydrophilic volatile organic compounds into aqueous suspensions of activated carbon. *Separation and Purification Technology*, **38** (3), 215-223.

Full Text: [S\Sep Pur Tec38, 215.pdf](S/Sep%20Pur%20Tec38,%20215.pdf)

Abstract: A new process combining the two conventional control techniques absorption and adsorption, which consists in scrubbing the gases with an aqueous slurry of fine-powdered activated carbon, was studied to reduce the emission of some hydrophilic volatile organic compounds (VOCs).

The collection of airborne isopropyl alcohol (IPA) and acetone vapors, the concentrations of which being in the range 1-5 g/m3, was carried out with aqueous suspensions containing up to 8 % (w/w) activated carbon, in a cables contactor operating at ambient temperature in a semi-continuous way with recycle of the slurry.

To interpret the experiments, a model was developed on the basis of the two-film theory of absorption, a Henry’s law for the solubility of organic compounds in water, and the assumption of a linear relationship between the instantaneous VOC contents of the solid and liquid phases. This model allows determining the overall gas-liquid height of transfer unit of the absorption column.

Experimental results clearly reveal the increase of the global uptake capacity of VOC due to the presence of carbon particles in the absorbent. Nevertheless, it appears that the gas-liquid mass transfer rate is reduced, contrary to the expected enhancement due to the so-called grazing effect or shuttle movement of carbon particles reported in the literature.

Same kinds of runs performed with slurries of non-adsorbing fine particles of silica resulted in a net increase of the overall gas-liquid and particularly of the liquid film mass transfer resistance. These runs show that, in the kind of absorber used, a substantial hindering influence of the solid particles accumulation in the liquid film also occurs when adsorbing particles are added to the liquid.

The lack of enhancement in presence of activated carbon was attributed moreover to an inefficient shuttle effect caused by a too small adsorption capacity of the soluble VOCs on the activated carbon. This was confirmed by some tests carried out with an hydrophobic compound which being strongly adsorbed led to an appreciable enhancement. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Volatile Organic Compounds, Absorption, Activated Carbon, Adsorption, Slurries, Mass Transfer, Gas-Absorption, Slurry Reactors, Solid Particles, Stirred Cell, Phase, Water

Adhoum, N. and Monser, L. (2004), Removal of phthalate on modified activated carbon: application to the treatment of industrial wastewater. *Separation and Purification Technology*, **38** (3), 233-239.

Full Text: [S\Sep Pur Tec38, 233.pdf](S/Sep%20Pur%20Tec38,%20233.pdf)

Abstract: This work investigates the efficiency of activated carbon that has undergone surface modification by impregnation with tetrabutylammonium (TBA) and copper in the removal of phthalate. Initially, the adsorption isotherms of phthalate on plain-carbon were measured at different pH values. It was concluded, using Langmuir model, that the adsorption capacity increased upon decreasing pH. To enhance the removal capacity at moderate pH, activated carbons were modified by immobilizing copper or TBA at their surface. The phthalate removal efficiencies of two separate fixed bed columns of Cu- and TBA-impregnated carbons were compared with that of plain activated carbon at pH 4. The results indicated that Cu-impregnated carbon has a removal capacity of nearly two times that of plain carbon. TBA impregnation was also shown to enhance the phthalate adsorption capacity with a factor of 1.7 times that of plain carbon. The observed results were explained in terms of chemisorption by forming Cu(Pht)2 or electrostatic interaction between positively charged TBA and phthalate anions. The overall phthalate removal is a combination adsorption capacity of plain activated carbon, and the extent of copper metal ions and TBA agent molecules immobilized on the carbon.

Keywords: Activated Carbon, TBA- and Cu-Modified Carbon, Fixed Bed Column

Deosarkar, S.P. and Pangarkar, V.G. (2004), Adsorptive separation and recovery of organics from PHBA and SA plant effluents. *Separation and Purification Technology*, **38** (3), 241-254.

Full Text: [S\Sep Pur Tec38, 241.pdf](S/Sep%20Pur%20Tec38,%20241.pdf)

Abstract: Adsorption as a process for the removal and recovery of organics from actual industrial effluents has been studied. The wastewater was obtained from Salicylic acid (SA) and p-hydroxy benzoic acid (PHBA) manufacturing units. The major constituents of the wastewater were Phenol, PHBA, SA and sodium sulphate. Equilibrium adsorption studies were carried out for four different polymeric resins, Amberlite XAD-2, -4, -7 and INDION 1014 MN-2 (IMN-2) having different surface areas, to find out the resin with maximum equilibrium loading capacity. Since IMN-2 gave the highest capacity it was used for further studies. Effect of presence of salt was also studied since the effluent contained a substantial amount of it. An attempt was made to correlate multi-solute equilibrium data using extended Langmuir model with a modification to account for salting out effect. The discrepancies in experimental and predicted values were attributed to the possible hydrogen bonding ability among the solutes. Column studies were also carried out to investigate the breakthrough behavior at two different flow rates to investigate the column capacity. LUB values were calculated to find out column efficiency. Regeneration was accomplished by four to five bed volumes of acetone. Quantitative recoveries of organics were obtained from the column operations for SA and PHBA plant effluents. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Polymeric Adsorbents, Industrial Effluents, Organics, Recovery, Multi-Solute Adsorption, Aqueous-Solution, Polymeric Adsorbents, Polystyrene Resins, Dissolved Organics, Activated Carbon, Mass-Transfer, Salting-Out, Sorption, Equilibria

? Çay, S., Uyanık, A. and Özaşık, A. (2004), Single and binary component adsorption of copper(II) and cadmium(II) from aqueous solutions using tea-industry waste. *Separation and Purification Technology*, **38** (3), 273-280.

Full Text: [2004\Sep Pur Tec38, 273.pdf](2004/Sep%20Pur%20Tec38,%20273.pdf)

Abstract: The adsorption ability of Turkish tea waste (fibrous) obtained from various tea-processing factories was investigated for the removal of Cu(II) and Cd(II) from single (non-competitive) and binary (competitive) aqueous systems. Adsorption of the investigated heavy metal ions by tea waste strongly depends on pH, contact time, initial concentration of the heavy metal ions and adsorbent dosage. The maximum adsorption capacities of Cu(II) and Cd(II) per gram tea waste were calculated as 8.64±0.51 and 11.29±0.48 mg for single and 6.65±0.31 and 2.59±0.28 mg for binary systems, respectively. The experimental data for single and binary Cu(II) and Cd(II) systems fitted the Freundlich isotherm model excellently (r2 = 0.977–0.992). The results show that tea-processing factory waste, which has a very low economical value, may be used effectively in removal of Cu(II) and Cd(II) ions from aqueous systems for environmental cleaning purposes.

Keywords: Adsorption, Tea Waste, Copper, Cadmium, Isotherms

Wibulswas, R. (2004), Batch and fixed bed sorption of Methylene blue on precursor and QACs modified montmorillonite. *Separation and Purification Technology*, **39** (1-2), 3-12.

Full Text: [S\Sep Pur Tec39, 3.pdf](S/Sep%20Pur%20Tec39,%203.pdf)

Abstract: The use of montmorillonite and its modified forms as an adsorbent in aqua system have been widely considered but the scope of much of the works has been restricted to batch tests, which may be a mean of selecting the best adsorbent for a given application but not necessary how it would be used in practice. This paper, therefore, deals with the comparison of batch and fixed bed adsorption of Methylene blue (C16H18ClN3S) by montmorillonite and its derivatives. The modified clays were prepared by altering the surface properties of the raw montmorillonite clay, from organophobic to organophilic, with four types of quaternary ammonium compounds (QACs). They are tetramethylammonium chloride (C4H12ClN), tetradecyltrimethylammonium bromide (C17H38BrN), hexadecyltrimethyl ammonium bromide (C19H42BrN), and benzyldimethylhexadecylammonium chloride (C25H46ClN), which are different in their molecular size and number of carbon atoms. The clay products, namely organo-clays, were characterized for their physical properties by BET surface analysis, particle sizing, and X-ray diffraction (XRD). Adsorption experiments of Methylene blue were performed by batch and fixed bed column techniques. The objective of the batch test is to determine the effect of the number of carbon atoms in QACs used for the preparation of organo-clays on their physical properties and also on the adsorption affinity of each clay towards the Methylene blue. For the column experiments, mixed sand-clays bed was used due to the fine particle size of clays. The effect of adsorbate flow rate, contact time, and the initial concentration of the solute were explored. The permeability of the mixed sand-clay bed was also studied. The results showed that the permeability of the mixed bed was decreased considerably in the presence of even small amount of clays. Batch results were well characterized by a Langmuir isotherm. Column results were correlated by Fornwalt and Hutchins method. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Ammonium, Analysis, Carbon, Chloride, Clay, Concentration, Dye, Fine Particle, Fixed Bed, Flow, Isotherm, Langmuir, Langmuir Isotherm, Methylene Blue, Modified, Montmorillonite, Organic Phenols, Organo-Clays, Organoclays, Paper, Particle, Particle Size, Permeability, Physical Properties, Pillared Clays, Practice, Products, Properties, Quaternary, Quaternary Ammonium, Removal, Smectite, Sorption, Surface, Surface Analysis, Surface Properties, Techniques, Water, X-Ray Diffraction, XRD

? Dwivedi, P., Gaur, V., Sharma, A. and Verma, N. (2004), Comparative study of removal of volatile organic compounds by cryogenic condensation and adsorption by activated carbon fiber. *Separation and Purification Technology*, **39** (1-2), 23-37.

Full Text: [S\Sep Pur Tec39, 23.pdf](S/Sep%20Pur%20Tec39,%2023.pdf)

Abstract: This paper describes studies on two abatement techniques, namely: adsorption by activated carbon fiber (ACF) and condensation at cryogenic temperatures for controlling emissions of volatile organic compounds (VOCs). The breakthrough analysis was carried out on commercially ACF packed in a tubular reactor under dynamic adsorption conditions. The breakthrough time was found to significantly decrease with increase in VOC concentration from 5000 to 50,000 ppm. The regeneration of ACF was carried out by electrical (dc ~50 V) heating. A temperature range of 120–150 °C and regeneration time of 45–60 min were typically required for the complete regeneration of ACF pre-equilibrated with 8000 ppm of VOC. The VOC removal by condensation was carried out in a vertical tubular condenser using liquid nitrogen (LN) as a coolant medium. The studies showed that adsorption was effective if VOCs concentrations in the pollutants laden gas were in parts per million (ppm) levels, whereas the removal by cryogenic condensation was found to be effective at the relatively higher VOCs concentrations levels (>1%). The simulation results from the mathematical models developed to understand the separation process in each of two methods studied were found to be in good agreement with the experimental data.

Keywords: Volatile Organic Compounds (VOC), Adsorption, Cryogenic Condensation, Activated Carbon Fiber (ACF), Breakthrough Analysis

Bektaş, N. and Kara, S. (2004), Removal of lead from aqueous solutions by natural clinoptilolite: Equilibrium and kinetic studies. *Separation and Purification Technology*, **39** (3), 189-200.

Full Text: [S\Sep Pur Tec39, 189.pdf](S/Sep%20Pur%20Tec39,%20189.pdf)

Abstract: In this study, the removal of lead ions from aqueous solution using natural clinoptilolite under different experimental conditions was investigated. The effects of the initial metal concentration, agitation speed, temperature and pH on the removal efficiency of lead were studied. Langmuir and Freundlich isotherm constants and correlation coefficients for the present system at different conditions were calculated and compared. The equilibrium process was described well by the Langmuir isotherm model with the maximum sorption capacity of 166 mg/g of lead on clinoptilolite.

The sorption kinetics were tested for the first order reaction, intra-particle diffusion, pseudo-first order, and pseudo-second order reaction at different experimental conditions. The rate constants of sorption for all these kinetic models were calculated. Good correlation coefficients were obtained for the pseudo-second order kinetic model showing that lead uptake process followed the pseudo-second order rate expression.

Keywords: Lead Removal, Clinoptilolite, Equilibrium Isotherm, Kinetics

Draa, M.T., Belaid, T. and Benamor, M. (2004), Extraction of Pb(II) by XAD7 impregnated resins with organophosphorus extractants (DEHPA, IONQUEST 801, CYANEX 272). *Separation and Purification Technology*, **40** (1), 77-86.

Full Text: [S\Sep Pur Tec40, 77.pdf](S/Sep%20Pur%20Tec40,%2077.pdf)

Abstract: The aim of this work is to study the extraction of Pb(II) from nitrate solutions (0.1 m) by solvent impregnated resins (SIR). The resins have been prepared by impregnating the amberlite XAD7 using three different organophosphorus extractants namely DEHPA, IONQUEST 801 and CYANEX 272. The impregnation of XAD7 is characterised by a higher affinity for DEHPA than for IONQUEST 801 and CYANEX 272. The adsorption of the extractant has been studied by FTIR which shows that the immobilisation of the extractant results from hydrophobic interaction between the alkyl group of the extractant and the aliphatic chain of the support, and also from other mechanisms like polar or electrostatic forces. Batch sorption studies shows that the sorption of the metal increases with aqueous pH solution and the best sorption efficiency obtained is higher than 95% for DEHPA and IONQUEST 801 in the pH range of 2.75–3 and 3.5–3.75, respectively, and it is about 70% for CYANEX 272 in the pH range 4.5–4.75. An equilibrium model is proposed for the analysis of the distribution data. The extraction of Pb(II) can be explained by the formation of PbL2 and PbNo3L complex in the resin phase in the case of XAD7–DEHPA resin, by the formation of PbL2HL2 and PbNo3L complex in the case of XAD7–IONQUEST 801, and by the formation of the single complex PbLNo3HL in the case of XAD7CY–ANEX 272. The equilibrium constants of these species are also reported.

Keywords: Pb(II), Solvent Impregnated Resin, DEHPA, IONQUEST 801, CYANEX

Gupta, V.K., Mittal, A., Krishnan, L. and Gajbe, V. (2004), Adsorption kinetics and column operations for the removal and recovery of malachite green from wastewater using bottom ash. *Separation and Purification Technology*, **40** (1), 87-96.

Full Text: [S\Sep Pur Tec40, 87.pdf](S/Sep%20Pur%20Tec40,%2087.pdf)

Abstract: The thermal power plant waste material, ‘bottom ash’ was utilized as a potential adsorbent for the toxic textile dye ‘malachite green’. Preliminary information was gathered by batch adsorption studies, which include effect of pH, adsorbent dose, contact time, adsorbate concentration and temperature. Plausible mechanism of the on-going adsorption process and thermodynamic parameters involved were obtained by carrying out kinetic measurements. The data obtained was successfully used to equate Langmuir and Freundlich adsorption isotherm models. A fixed-bed column was designed and necessary parameters were calculated by applying mass transfer kinetic approach. Attempts were also made to recover dye and regenerate the column.

Keywords: Malachite Green, Bottom Ash, Adsorption, Waste Material, Kinetics

Silva, J.P., Sousa, S., Gonçalves, I., Porter, J.J. and Ferreira-Dias, S. (2004), Modelling adsorption of acid orange 7 dye in aqueous solutions to spent brewery grains. *Separation and Purification Technology*, **40** (2), 163-170.

Full Text: [S\Sep Pur Tec40, 163.pdf](S/Sep%20Pur%20Tec40,%20163.pdf)

Abstract: Acid orange 7 (AO7) is a monoazo acid dye currently used in paper and textile industries. The modelling and optimisation of AO7 adsorption to spent brewery grains (SBG), a by-product of the brewing process, was performed using response surface methodology (RSM). SBG was used dried or previously acid hydrolysed. Five central composite rotatable designs (CCRD), as a function of two variables, each, were followed, namely: (1) amount of SBG and hydrolysis time of SBG, (2) hydrolysis and adsorption times, (3) amount of SBG and adsorption time (*T*), (4) *T* and pH medium and (5) *T* and AO7 concentration.

Hydrolysis of SBG showed not significantly increase its adsorption capacity for AO7 dye. Tri-dimensional response surfaces were fitted to the experimental data concerning the removal of dye obtained in CCRD-3 to CCRD-5. From CCRD-3, the best adsorption conditions (96% removal) were estimated for 5.1% (m/v) of SBG after 36 min contact. From CCRD-4, removals above 90% were observed for lower pH values and adsorption times higher than 30 min. An increase in AO7 adsorbed per unit weight of SBG was observed with increasing initial AO7 concentration.

Also, SBG was reused in 12 consecutive batches, under previously optimised conditions. SBG residual adsorption activity can be well described by a first-order decay model. A maximum amount of adsorbed AO7 of 29 mg/g SBG is predicted from the cumulative curve.

Keywords: Acid Orange 7, Adsorption, Monoazo Acid Dye, Response Surface Methodology, Reutilisation, Spent Brewery Grains

Ghiaci, M., Abbaspur, A., Kia, R. and Seyedeyn-Azad, F. (2004), Equilibrium isotherm studies for the sorption of benzene, toluene, and phenol onto organo-zeolites and as-synthesized MCM-41. *Separation and Purification Technology*, **40** (3), 217-229.

Full Text: [S\Sep Pur Tec40, 217.pdf](S/Sep%20Pur%20Tec40,%20217.pdf)

Abstract: Nonionic organic contaminants (NOCs) such as benzene, toluene, and phenol from contaminated wastewater can be effectively adsorbed by organo-zeolites. Organo-zeolites were prepared from synthetic ZSM-5 and natural zeolites, by exchanging the quaternary amines, i.e. hexadecyltrimethylammonium (HDTMA) bromide and *n*-cetylpyridinium bromide (CPB). The maximum adsorption of CPB onto these zeolites is in the order of clinoptilolite>ZSM-5-88 (SiO2/Al2O3=88)>ZSM-5-31 (SiO2/Al2O3=31) which is mainly dependent on the external cation exchange capacity (ECEC) of each zeolite. Batch adsorption experiment was carried out to remove benzene, toluene, and phenol from aqueous solution using the above-mentioned organo-zeolites. In addition, as-synthesized MCM-41 molecular sieve was employed for removal of organic contaminants from aqueous solution. The experimental results were fitted to the Langmuir, Freundlich, Redlich–Peterson and linear equation isotherms to obtain the characteristic parameters of each model. Our resultant data showed that nonlinear form of Langmuir, the Freundlich and Redlich–Peterson could be fitted well with sorption data in most cases. According to the evaluation using the Langmuir equation, the maximum organics adsorption by synthesized MCM-41 was much greater than that of the natural clinoptilolite and ZSM-5 zeolites.

Keywords: Adsorption, Benzene, Toluene, Phenol, ZSM-5, MCM-41, Natural Clinoptilolite, HDTMA bromide, CPB

Shawabkeh, R., Al-Harahsheh, A. and Al-Otoom, A. (2004), Copper and zinc sorption by treated oil shale ash. *Separation and Purification Technology*, **40** (3), 251-257.

Full Text: [S\Sep Pur Tec40, 251.pdf](S/Sep%20Pur%20Tec40,%20251.pdf)

Abstract: Jordanian oil shale ash was used as an adsorbent for the removal of copper and zinc from aqueous solution. This ash was treated with either hydrochloric, nitric, sulfuric or phosphoric acids followed by washing and/or neutralization with sodium hydroxide in order to enhance its adsorption capacity. The sample that was treated with nitric acid showed the highest cation exchange capacity (CEC) of 146 meq/100 g, while the one that was treated with sulfuric acid showed a value of 32 meq/100 g. Different adsorption isotherm data for both copper and zinc were obtained using the nitric acid-treated sample at different pH values. Freundlich and BET models were used to fit the experimental data, which showed that BET best-fitted these data. The separation factor for these isotherms shows unfavorable adsorption type at lower pH value.

Keywords: Oil Shale, Ash, Adsorption, Copper and Zinc Removal

? Ghiaci, M., Kia, R., Abbaspur, A. and Seyedeyn-Azad, F. (2004), Adsorption of chromate by surfactant-modified zeolites and MCM-41 molecular sieve. *Separation and Purification Technology*, **40** (3), 285-295.

Full Text: [2004\Sep Pur Tec40, 285.pdf](2004/Sep%20Pur%20Tec40,%20285.pdf)

Abstract: Synthetic and natural zeolites, modified by the quaternary amines, i.e. hexadecyltrimethylammonium (HDTMA) bromide and n-cetylpyridinium bromide (CPB) as well as MCM-41 molecular sieve were employed for removal of chromate from aqueous solution. Obtained data from chromate adsorption experiments over the mentioned materials were compared. It was shown that adsorption data for modified zeolite using the amine was consistent with Langmuir isotherm equation. The maximum chromate adsorption over as synthesized MCM-41 was much greater than that of the natural clinoptilolite and ZSM-5 zeolites. (C) 2004 Elsevier B.V All rights reserved.

Keywords: Adsorption, Amine, Amines, Cationic Surfactant, Chromate, Chromate Adsorption, Clinoptilolite, CPB, Hdtma, Hexadecyltrimethylammonium, Isotherm, Langmuir, Langmuir Isotherm, Materials, MCM-41, Modified, Natural, Natural Clinoptilolite, Quaternary, Reduction, Removal, Sorption, Zeolite, ZSM-5

Silva, J.P., Sousa, S., Rodrigues, J., Antunes, H., Porter, J.J., Gonçalves, I. and Ferreira-Dias, S. (2004), Adsorption of acid orange 7 dye in aqueous solutions by spent brewery grains. *Separation and Purification Technology*, **40** (3), 309-315.

Full Text: [S\Sep Pur Tec40, 309.pdf](S/Sep%20Pur%20Tec40,%20309.pdf)

Abstract: Spent brewery grains (SBG), a by-product of the brewing process, were tested as an adsorbent of acid orange 7 dye (AO7), a monoazo acid dye currently used in paper and textile industries. The presence of AO7 in these effluents causes obvious environmental problems.

Kinetics studies of adsorption of AO7 to SBG (3.75%, m/v) were carried out at 20 °C, using aqueous solutions with different AO7 concentrations (30–834 mg/L). For every situations tested, no significant variation in residual AO7 concentration in solution was detected after 1 h contact between the dye and the adsorbent. The adsorption process followed a pseudo-first order model.

The equilibrium process showed to be well described by both Freundlich and Langmuir isotherm models, at 20 and 30 °C. The maximum adsorption capacity was estimated to be 30.5 mg AO7/g SBG, at 30 °C.

Free energy of adsorption (Δ*G*°), enthalpy (Δ*H*°), and entropy (Δ*S*°) changes were calculated to predict the nature of adsorption. The estimated values for Δ*G*° were −22.78 and −24.53 kJ/mol, respectively, at 293.3 K (20 °C) and 303.3 K (30 °C), which are rather low indicating that a spontaneous process occurred. The enthalpy changes and entropy of adsorption were 28.66 and 175.36 J/mol K, respectively. The positive value for Δ*H*° indicates that the adsorption of AO7 dye to SBG is an endothermic process. The positive value of entropy reflects the affinity of the adsorbent for AO7 dye.

The obtained results are very promising since: (i) high levels of colour removal (>90%) were achieved with low contact times adsorbent/dye (less than 1 h contact), and (II) the whole SBG can be successfully used as adsorbent of AO7 dye in aqueous solution without needing any previous treatments such as milling and/or sieving. Spent grains, being a cheap, and easily available material, can be an alternative for more costly adsorbents used for dye removal in wastewater treatment processes.

Keywords: Acid Orange 7 (AO7), Adsorption Isotherms, Monoazo Acid Dye, Spent Brewery Grains (SBG)

Sarioglu, M. (2005), Removal of ammonium from municipal wastewater using natural Turkish (Dogantepe) zeolite. *Separation and Purification Technology*, **41** (1), 1-11.

Full Text: [S\Sep Pur Tec41, 1.pdf](S/Sep%20Pur%20Tec41,%201.pdf)

Abstract: This paper concerns the removal of ammonium ions from wastewater using a naturally occurring zeolite from Dogantepe region in Turkey. Both batch and continuous (column) experiments were carried out. In batch studies, effects of stirring time (5–120 min) and initial ammonium concentration (8.8–885 mg NH4+-N l−1) on removal efficiency and adsorption isotherms were investigated. In column studies, effects of flowrate, pH, initial ammonium concentration, washing with acid and regeneration on the ammonium adsorption capacity of the zeolite were determined. Increasing initial ammonium nitrogen concentration from 5.0 to 12.0 mg l−1, increased the exchange capacity from 0.70 to 1.08 mg NH4+-N g−1. The flowrate and pH values, at which the highest adsorption capacities were obtained, were found to be 0.5 ml min−1 (0.87 mg NH4+-N g−1 zeolite) and 4 (mg NH4-N l−1), respectively. The corresponding values after washing with acid and regeneration were determined to be 1.32 and 0.73 mg NH4+-N g−1, respectively. The cation exchange capacity of Dogantepe zeolite was found to be 164.62 meq. per 100 g. These findings show that Dogantepe zeolite can be used for the removal of ammonium from wastewater.

Keywords: Zeolite, Clinoptilolite, Mordenite, Ammonium Removal, Exchange Capacity, Wastewater

Dubey, S.S. and Gupta, R.K. (2005), Removal behavior of Babool bark (*Acacia nilotica*) for submicro concentrations of Hg2+ from aqueous solutions: A radiotracer study. *Separation and Purification Technology*, **41** (1), 21-28.

Full Text: [S\Sep Pur Tec41, 21.pdf](S/Sep%20Pur%20Tec41,%2021.pdf)

Abstract: The uptake behavior of Babool bark (*Acacia nilotica*) for the micro to trace levels of Hg2+ from aqueous solutions has been carried out in batch equilibrium experiments, employing a ‘radiotracer technique’. A high level of uptake of metal ions on the solid surface occurs within ca. 2 h of contact time. The increase of sorptive concentration (10−7 to 10−2 M), temperature (303–333 K), and pH (3–10) favored the removal process of ions. The percentage adsorption increases from 54.3 to 91.3% with an increase in dilution of sorptive solution from 10−2 to 10−7 M. First order uptake of Hg2+ followed the Freundlich and Dubinin–Radushkevich (D–R) isotherms for the entire range of adsorptive concentration studied. Temperature dependence data show that this process is endothermic in nature. Desorption experiments further confirm the irreversibility of the sorption process as no significant desorption took place in the bulk concentration of the adsorptive.

Keywords: Sorption, Hg(II), Radiotracer, Freundlich, Babool Bark, Desorption

Gawade, A.S., Vanjara, A.K. and Sawant, M.R. (2005), Removal of herbicide from water with sodium chloride using surfactant treated alumina for wastewater treatment. *Separation and Purification Technology*, **41** (1), 65-71.

Full Text: [S\Sep Pur Tec41, 65.pdf](S/Sep%20Pur%20Tec41,%2065.pdf)

Abstract: Alumina surface was modified by adsorption of an anionic surfactant, sodium dodecyl sulfate (SDS). Typical S-shaped isotherm of surfactant on alumina was observed. The adsorption of herbicide on alumina and surfactant treated alumina has been investigated. The enhancement in adsorption of herbicide on surfactant treated alumina is observed, which may be attributed to the solubilization of herbicide on surfactant aggregates formed at solid/liquid interface. The effect of pH on adsorption has been studied. The adsorption is greatly influenced by pH of the medium. The applicability of Freundlich equation was tested for equilibrium data.

The influence of various factors such as initial concentration, agitation speed, mass of adsorbent and temperature on adsorption was also studied. The batch kinetics has been tested to pseudo second order reaction and rate constants were calculated.

Keywords: Alumina, Surfactant-Treated Alumina, Herbicide, Solubilization

? Ning, P., Bart, H.J., Jiang, Y.J., de Haan, A. and Tien, C. (2005), Treatment of organic pollutants in coke plant wastewater by the method of ultrasonic irradiation, catalytic oxidation and activated sludge. *Separation and Purification Technology*, **41** (2), 133-139.

Full Text: [2005\Sep Pur Tec41, 133.pdf](2005/Sep%20Pur%20Tec41,%20133.pdf)

Abstract: The paper deals with the degradation of the organic pollutants in coke plant wastewater by the combination process of ultrasonic irradiation, catalytic oxidation and activated sludge. The effect factors of ultrasonic irradiation on the degradation of the organic pollutants such as saturating Vs, initial pollutant concentration, ultrasonic power density, the category and consumption of catalyst were investigated. The results indicate that putting the saturating gas into the reaction solution in the process of the ultrasonic irradiation, low COD initial concentration and high ultrasonic power density are the favorable conditions for their degradation. Compared with single activated-sludge process, co-approach of ultrasonic irradiation and activated-sludge can greatly increase the COD degradation efficiency. When the wastewater was firstly treated by ultrasonic irradiation process and then followed by activated-sludge process for 240 min, respectively, the COD degradation efficiency increased by 48.29-80.54%. Additionally, when 3.0 mmol/l of ferrous sulfate was added into the ultrasonic irradiation process, the COD degradation efficiency was as high as 95.74%, 63.49% higher than that of the activated-sludge approach alone. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Aqueous-Solution, COD Degradation, Coke Plant Wastewater, Coking Wastewater, Combination Process, Water Quality Model

Alam, J.B., Dikshit, A.K. and Bandyopadhayay, M. (2005), Evaluation of thermodynamic properties of sorption of 2,4-D and atrazine by tire rubber granules. *Separation and Purification Technology*, **42** (1), 85-90.

Full Text: [S\Sep Pur Tec42, 90.pdf](S/Sep%20Pur%20Tec42,%2090.pdf)

Abstract: An attempt has been made in this paper to develop simple and easily understandable thermodynamic parameters related with the formation of activated complex and sorption process at equilibrium. The overall scenario represented by thermodynamic parameters was found to be a better indicator of understanding the process. Because it gives a general idea whether the process is exothermic or endothermic and also whether the process is stable or unstable. Sorption of 2,4-dichloro-phenoxy-acetic acid (2,4-D) and 2-chloro-4-ethyalamino-6-isopropylamino-*s*-traiazine (atrazine) on rubber granules followed second order reversible kinetic equation. 2,4-d–rubber granules system showed endothermic nature while atrazine–rubber granules showed exothermic nature. The values of *E*a (associated with formation of activated species) were in the range of 3.49 kcal/mol and −2.40 kcal/mol for 2,4-d and atrazine, respectively. During equilibrium condition, both the systems showed negative Gibb’s energy, which indicates stability of system.

Keywords: 2,4-D, Atrazine, Enthalpy Change, Entropy Change, Gibb’s Energy, Arrhenius Activated Energy, Aqueous-Solution, Adsorption, Carbofuran, Removal, Soils, Field

Uguina, M.A., Sotelo, J.L., Delgado, J.A., Gómez, J.M. and Celemín, L.I. (2005), Adsorption of methyl ethyl ketone and trichloroethene from aqueous solutions onto silicalite fixed-bed adsorbers. *Separation and Purification Technology*, **42** (1), 91-99.

Full Text: [S\Sep Pur Tec42, 91.pdf](S/Sep%20Pur%20Tec42,%2091.pdf)

Abstract: This work addresses the adsorption of methyl ethyl ketone (MEK) and trichloroethene (TCE) from aqueous solutions on agglomerated silicalite. Results from both equilibrium and fixed-bed adsorption studies in aqueous solutions are given. The breakthrough curves of MEK could be described adequately with a bidisperse model. It was observed that the mass transfer of MEK is controlled by both the external and the macropore transport. The breakthrough curves of TCE are also adequately described with the same model, for which the micropore resistance was the most important one. The thermal regeneration of the agglomerated silicalite loaded with MEK by passing a purging gas through the bed (nitrogen and air) was also studied. No decrease of the adsorption capacity with the number of regeneration cycles was observed.

Keywords: Methyl Ethyl Ketone, Trichloroethene, Silicalite, Adsorption, Modeling

? Košutić, K., Furač, L., Sipos, L. and Kunst, B. (2005), Removal of arsenic and pesticides from drinking water by nanofiltration membranes. *Separation and Purification Technology*, **42** (2), 137-144.

Full Text: [S\Sep Pur Tec42, 137.pdf](S/Sep%20Pur%20Tec42,%20137.pdf)

Abstract: The removal of arsenic and pesticides from natural ground water from the Slavonia region, Croatia, by two commercial nanofiltration membranes (NF270 and NFc) was investigated. The nanofiltration membranes and a comparing reverse osmosis membrane were first examined using sodium dibasic arsenate solution and judged against their performances using sodium chloride and sodium sulfate solutions. The rejections of the sodium dibasic arsenate as well as the arsenate anion from the natural groundwater by the nanofiltration membranes are satisfactory high, and one of the nanofiltration membranes exhibit the superior permeation rate values. The outstanding permeation rate values of these membranes in relation to the reverse osmosis membrane promise a noteworthy decrease of energy consumption and energy costs for the process when using these membranes.

The prevailing mechanism of ion retention by the negatively charged nanofiltration membranes is the charge exclusion. The size exclusion mechanism is also important but not sufficient for the uncharged organic molecules rejection. The membrane material and the membrane pore size distribution (PSD) also influence the uncharged organic molecules rejections. The rejections of pesticides are reasonably high, and besides the size effect, the specific physicochemical phenomena should be considered in order to understand their rejection by the nanofiltration membranes.

Keywords: Nanofiltration, Membranes, Arsenic Removal, Pesticides Removal, Groundwater, Pore Size Distribution

? Boonamnuayvitaya, V., Sae-ung, S. and Tanthapanichakoon, W. (2005), Preparation of activated carbons from coffee residue for the adsorption of formaldehyde. *Separation and Purification Technology*, **42** (3), 159-168.

Full Text: [S\Sep Pur Tec42, 159.pdf](S/Sep%20Pur%20Tec42,%20159.pdf)

Abstract: Six types of activated carbons were prepared from coffee residues by varying activating agents of zinc chloride, nitrogen, carbon dioxide and steam. Characterization of these samples was performed by using nitrogen adsorption isotherms, thermogravimetric analysis (TGA), scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR) in order to understand the coffee residue activated carbon and its adsorptive capacity. All of activated carbons and one commercial activated carbon (CH-I1000) were subjected to the adsorption of formaldehyde vapor. The coffee activated carbon prepared with ZnCl2 impregnation and nitrogen activation (CZn-N2) demonstrates its highest capacity of formaldehyde adsorption owing to the hydrophilic functional groups of O-H, C=O, C-O on the surface. The coffee activated carbon prepared with ZnCl2 impregnation coupled with carbon dioxide activation (CZn-N2-CO2) yields the highest total surface area (914±21 m2/g) and total pore volume (1.010±0.003 cc/g) with the hydrophobic groups on the surface adsorbed formaldehyde less than CZn-N2. Therefore, we conclude that the formaldehyde adsorption by activated carbons in this work is affected by surface chemistry more than texture characteristics of surface area and pore volume.

Keywords: Activated Carbon, Coffee residues, ZnCl2, Formaldehyde, Adsorption

? Dhakal, R.P., Ghimire, K.N., Inoue, K., Yano, M. and Makino, K. (2005), Acidic polysaccharide gels for selective adsorption of lead(II) ion. *Separation and Purification Technology*, **42** (3), 219-225.

Full Text: [S\Sep Pur Tec42, 219.pdf](S/Sep%20Pur%20Tec42,%20219.pdf)

Abstract: The adsorption behavior of lead(II), zinc(II) and copper(II) on crosslinked pectic and alginic acids, and their amide derivatives form has been investigated. The selectivity order for metal ion uptake is lead(II) > copper(II) > zinc(II). The nature of such acidic polysaccharides for the removal of lead(II) ion was examined through batch wise tests and column tests and compared with that for the commercially available weakly acidic cation exchange DIAION WK resins. The experimental results revealed that chemically modified acidic polysaccharides exhibit much better separation performance compared to the latter, which suggests a high possibility of their applications in the practical separation and purification of lead(II) ion.

Keywords: Pectic Acid, Alginic Acid, Polysaccharide Gels, Lead(II) Ion, Adsorptive Removal

? Li, N. and Bai, R.B. (2005), Copper adsorption on chitosan–cellulose hydrogel beads: Behaviors and mechanisms. *Separation and Purification Technology*, **42** (3), 237-247.

Full Text: [S\Sep Pur Tec42, 237.pdf](S/Sep%20Pur%20Tec42,%20237.pdf)

Abstract: The application of chitosan–cellulose hydrogel beads as an adsorbent for Cu adsorption from aqueous solutions was examined. Chitosan was blended with cellulose to make chitosan–cellulose hydrogel beads and the hydrogel beads were crosslinked with ethylene glycol diglycidyl ether (EGDE). It was found that the addition of cellulose to chitosan made the hydrogel beads materially denser and the crosslinking reaction improved the chemical stability of the chitosan–cellulose beads in solutions with pH values down to 1. Batch adsorption experiments indicated that both the chitosan–cellulose and the crosslinked chitosan–cellulose hydrogel beads had high adsorption capacities for Cu removal, with the optimum pH in the range around neutral, although the crosslinked chitosan–cellulose beads always exhibited slightly lower adsorption capacities than the non-crosslinked beads. The adsorption isotherm of the chitosan–cellulose beads can be well-fitted to the Langmuir model, but that of the crosslinked chitosan–cellulose can only be well described by the Freundlich model. Copper adsorption kinetics on both types of the beads clearly followed an initial transport-controlled adsorption phenomenon. Fourier Transform Infrared (FTIR) Spectroscopy and X-ray photoelectron spectroscopy (XPS) revealed that Cu adsorption on the beads mainly involved the nitrogen atoms in chitosan to form surface complexes.

Keywords: Chitosan–cellulose Beads, EDGE Crosslinking, Cu Adsorption, Surface Interaction, Mechanisms

? Erdem, M. and Özverdi, A. (2005), Lead adsorption from aqueous solution onto siderite. *Separation and Purification Technology*, **42** (3), 259-264.

Full Text: [S\Sep Pur Tec42, 259.pdf](S/Sep%20Pur%20Tec42,%20259.pdf)

Abstract: In this paper, the ability of siderite to remove Pb2+ from aqueous solution by adsorption has been investigated through batch experiments. The Pb2+ adsorption property of the siderite was evaluated as a function of pH, siderite dosage, initial Pb2+ concentration, and temperature. Maximum Pb2+ adsorption yield was obtained to be 99.6% for initial Pb2+ concentration of 50 mg/l at 25 °C and pH 2.97 for 180 min in the presence of 10 g/l siderite. Adsorption data obtained at 25, 30 and 35 °C showed that the adsorption process fitted first-order adsorption rate expression and Langmuir and Freundlich adsorption models. Adsorption capacities of siderite at 25, 30 and 35 °C were found to be 10.32, 12.45 and 14.06 mg Pb2+/g siderite, respectively. Adsorption enthalpy and activation energy values were calculated to be 49.73 and 32.49 kJ/g mol from the isotherm and kinetic data, respectively.

Keywords: Lead Removal, Adsorption, Siderite, Heavy Metal, Wastewater Treatment

? Ghorai, S. and Pant, K.K. (2005), Equilibrium, kinetics and breakthrough studies for adsorption of fluoride on activated alumina. *Separation and Purification Technology*, **42** (3), 265-271.

Full Text: [S\Sep Pur Tec42, 265.pdf](S/Sep%20Pur%20Tec42,%20265.pdf)

Abstract: Contamination of drinking water due to fluoride is a severe health hazard problem. Excess of fluoride (>1.5 mg/l) in drinking water is harmful to the human health. Various treatment technologies for removing fluoride from groundwater have been investigated in the past. Present investigation aims to remove fluoride by activated alumina. Adsorption isotherm has been modeled by Langmuir equation and isotherm constants. The dependence of the adsorption of fluoride on the pH of the solution has been studied to achieve the optimum pH value and a better understanding of the adsorption mechanism. It was found that maximum adsorption takes place at pH value of 7. Breakthrough analysis revealed that early saturation and lower fluoride removal takes place at higher flow rate and at higher concentrations. Predicted simulation results of one-dimensional model for isothermal, axially dispersed fixed bed on the assumption of pore-diffusion rate-control conditions matches with the experimental data in the initial zone of the breakthrough curve, but deviated marginally in the final tailing zone. Bed depth service time (BDST) model was also applied successfully.

Keywords: Fluoride, Activated Alumina, Adsorption, Regeneration, Breakthrough, Modeling

? Shukla, S.R. and Pai, R.S. (2005), Adsorption of Cu(II), Ni(II) and Zn(II) on dye loaded groundnut shells and sawdust. *Separation and Purification Technology*, **43** (1), 1-8.

Full Text: [S\Sep Pur Tec43, 1.pdf](S/Sep%20Pur%20Tec43,%201.pdf)

Abstract: The potential of cheap cellulose-containing natural materials like groundnut shells and sawdust was assessed for Cu(II), Ni(II) and Zn(II) adsorption from their aqueous solutions. These materials showed good adsorption capacities, although the levels differed depending on the combination of adsorbing material and metal ion. Application of a specific dye, C.I. Reactive Orange 13 onto the material further enhanced the adsorption capacity. The maximum metal ion uptake values for Cu(II), Ni(II) and Zn(II) were 7.60, 7.49 and 9.57 mg/g, respectively, for the dye loaded groundnut shells as against the respective values 4.46, 3.83 and 7.62 mg/g achieved when the unloaded groundnut shells was used as adsorbent. Similarly, the dye loaded sawdust gave the adsorption values 8.07 mg/g for Cu(II), 9.87 mg/g for NI(11) and 17.09 mg/g for Zn(11), which were higher than the corresponding values 4.94, 8.05 and 10.96 mg/g achieved with unloaded sawdust as adsorbent. With lowering of the pH of a metal ion solution, all the adsorbing materials showed a decrease in the adsorption capacities. When the pH of a metal cation solution was decreased to the lowest level at 1.5, the adsorption reached to very low values in all the cases. Even under low pH, the adsorption of metal ions on dye-loaded adsorbents was comparatively higher. This was made use of in desorption studies. Adsorption isotherm models were developed wherein the best fit was obtained in the Langmuir model. The regeneration and reusability of the adsorbents were also assessed for three successive adsorption-desorption cycles and were found to retain the adsorptive capacity. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorption-Desorption, Groundnut Shells, Heavy Metals, Reactive Dye, Sawdust, Cellulosic Materials, Aqueous-Solutions, Ion Removal, Metal-Ions, Sorption, Cadmium, Lead, Biosorption, Effluents, Zinc

? Mittal, A., Krishnan, L. and Gupta, V.K. (2005), Removal and recovery of malachite green from wastewater using an agricultural waste material, de-oiled soya. *Separation and Purification Technology*, **43** (2), 125-133.

Full Text: [S\Sep Pur Tec43, 125.pdf](S/Sep%20Pur%20Tec43,%20125.pdf)

Abstract: De-oiled soya is a waste product obtained during the processing of soyabean in soya oil extraction mills. Attempts have been made to exploit this wonder crop for different purposes to mitigate many of our problems. This laboratory utilized de-oiled soya as waste material and low cost adsorbent for the removal of toxic textile dye ‘malachite green’. The characterization of the adsorbent was done through IR and DTA curves and preliminary investigations were carried out by batch adsorption technique, which includes effect of pH, adsorbate concentration, sieve size, adsorbent dosage, contact time, temperature, etc. Tenable mechanism of the ongoing adsorption process and thermodynamic parameters were also obtained from Langmuir and Freundlich adsorption isotherm models. The kinetic measurements helped in determining the specific rate constant confirming the applicability of the first-order rate expression. To identify whether the on-going process is particle diffusion or film diffusion, the treatment given by Boyd and Reichenberg was employed. To assess the practical utility of the adsorbent a fixed bed column was designed and necessary parameters were calculated by applying mass transfer kinetic approach. Experiments were also performed for recovery of loaded dye through chemical regeneration of spent column and an estimate of the operational cost was also calculated.

Keywords: Waste Material, Malachite Green, De-Oiled Soya, Adsorption, Kinetics

? Sivaiah, M.V., Venkatesan, K.A., Krishna, R.M., Sasidhar, P. and Murthy, G.S. (2005), Ion exchange properties of strontium on in situ precipitated polyantimonic acid in amberlite XAD-7. *Separation and Purification Technology*, **44** (1), 1-9.

Full Text: [S\Sep Pur Tec44, 1.pdf](S/Sep%20Pur%20Tec44,%201.pdf)

Abstract: Polyantimonic acid was precipitated in the pores of Amberlite XAD-7 (PAA–XAD) and studied for the ion exchange of strontium as a function of various parameters, such as time, strontium ion concentration and temperature. Nearly 30% of the Sb2O5 was impregnated into XAD-7 exhibiting an experimental capacity of 23 mg/g of strontium. Distribution coefficient of strontium on PAA–XAD was found to be 6069 mL/g at 0.1 mol/L nitric acid and it decreased with increase in the concentration of nitric acid. Rapid uptake in the initial stages of equilibration was observed followed by sluggish rate of exchange and the ion exchange reaction was found to follow the second order rate equation. The rate constant and energy of activation for such reaction were found to be 8.4×10−3 L mg-1 min-1 at 300 K and 79 kJ/mol, respectively. The data obtained in this study were fitted into Langmuir adsorption model and Langmuir constants obtained at various temperatures were utilized for estimating the enthalpy change (Δ*H*o) accompanied by the ion exchange. The performance of the sorbent under dynamic conditions was evaluated by following a breakthrough curve using simulated waste solutions.

Keywords: Polyantimonic Acid, Ion Exchange, Breakthrough Curve, Langmuir Model

? Adak, A., Bandyopadhyay, M. and Pal, A. (2005), Removal of crystal violet dye from wastewater by surfactant-modified alumina. *Separation and Purification Technology*, **44** (2), 139-144.

Full Text: [S\Sep Pur Tec44, 139.pdf](S/Sep%20Pur%20Tec44,%20139.pdf)

Abstract: Sodium dodecyl sulfate (SDS), an anionic surfactant (AS) was used for the surface modification of neutral alumina. Micelle-like structures are formed on the surface of alumina, which are capable of removing organic pollutants from water environment. The surfactant-modified alumina (SMA) was used for the removal of crystal violet (CV), a well-known cationic dye from aquatic environment. The kinetic studies showed that 1 h shaking time was sufficient to achieve the equilibrium. The removal of CV followed the second order kinetics. Studies were conducted to see the effects of adsorbent dose and initial CV concentration on the removal of CV using SMA. The pH was maintained at 6.7±0.1. SMA was found to be very efficient adsorbent, and ~99% efficiency could be achieved under optimised conditions for the removal of CV when present even at a high concentration (200 ppm). The effects of various other parameters such as pH, temperature, the presence of different ions (Cl−, NO3−, SO4−2, HPO4−2 and Fe3+), and humic acid on the CV removal were also studied. The pH in the range of 7.0–8.5 favours the removal. It was observed that the removal efficiency was increased due to the presence of anions and humic acid and was decreased due to the presence of cations. Temperature had no effect in this process. To test whether the removal of CV was possible from real water using SMA, the adsorption study was conducted using CV spiked samples using distilled water, tap water and synthetically prepared wastewater. It was interesting to note that the removal efficiency was even better for tap water and much better for wastewater when compared to that using distilled water. Desorption of CV from the SMA surface was possible using 1 M sodium hydroxide solution, rectified spirit and acetone.

Keywords: Alumina, Sodium Dodecyl Sulfate, Surfactant-Modified Alumina, Crystal Violet, Removal

? Du, Q., Liu, S., Cao, Z. and Wang, Y. (2005), Ammonia removal from aqueous solution using natural Chinese clinoptilolite. *Separation and Purification Technology*, **44** (3), 229-234.

Full Text: [S\Sep Pur Tec44, 229.pdf](S/Sep%20Pur%20Tec44,%20229.pdf)

Abstract: This paper assesses the potential of natural Chinese clinoptilolite for ammonia removal from aqueous solution. In batch study, the effects of relevant parameters, such as contact time, pH and initial ammonia concentration were examined, respectively. The results show that although contact time needs at least 4 h in order to attain exchange equilibrium, ammonia removal by clinoptilolite occurs rapidly within the first 15 min of contact time, the pH has an effect on ammonia removal efficiency as it can influence both the character of the exchanging ions and the clinoptilolite itself, the ammonia removal capacity of clinoptilolite increases with the increase of initial ammonia concentration. In column study, clinoptilolite bed was exhausted at different flow velocities and ammonia breakthrough capacity of clinoptilolite bed was calculated. Furthermore, the optimum regeneration conditions were considered. The results show that flow velocity can affect breakthrough capacity of clinoptilolite by changing hydraulic retention time and the volume of 15–20 BV of 0.5 mol/L sodium chloride solution at pH 11–12 is sufficient for complete regeneration of clinoptilolite in column.

Keywords: Ammonia removal, Capacity, Clinoptilolite, Ion exchange, Zeolite

? Zhang, T., Walawender, W.P. and Fan, L.T. (2005), Increasing the microporosities of activated carbons. *Separation and Purification Technology*, **44** (3), 247-249.

Full Text: [S\Sep Pur Tec44, 247.pdf](S/Sep%20Pur%20Tec44,%20247.pdf)

Abstract: The microporosities of activated carbons were increased by two treatments. One involved depositing fine carbon particles on the activated carbons from pyrolyzing methanol accompanied by heating, and the other involved solely the heating of activated carbons in an inert atmosphere. The surface areas and pore volumes of the activated carbons increased by 43.43% and 75.75%, respectively, upon the former treatment, and as much as 61.96% and 100.82%, respectively, upon the latter treatment. Moreover, the number of pores with diameters ranging from 0.4 to 2.0 nm was appreciably magnified by both treatments, thereby giving rise to an increase in their microporosities.

Keywords: Activated carbons, Adsorption, Carbon deposition, Heat treatment, Methanol

? Lin, H.R. and Lin, C.I. (2005), Kinetics of adsorption of free fatty acids from water-degummed and alkali-refined soy oil using regenerated clay. *Separation and Purification Technology*, **44** (3), 258-265.

Full Text: [S\Sep Pur Tec44, 258.pdf](S/Sep%20Pur%20Tec44,%20258.pdf)

Abstract: The adsorption kinetics of residual free fatty acids (FFA) from water-degummed and alkali-refined soy oil with regenerated clay was investigated by determining the concentration change of FFA in the oils before and after adsorption. Experimental results indicated that FFA concentration was reduced as adsorption proceeded, reached a minimum at fifteen min and then increased as time increased further. The initial adsorption rate was found to increase upon increasing the initial FFA concentration, the ratio of clay/oil or agitation speed. The rate could also be increased upon decreasing the particle size or adsorption pressure. The effects of water content of clay and temperature on the initial adsorption rate, however, were found to be mild. Furthermore, the empirical rate expression for the adsorption of FFA has been determined.

Keywords: Adsorption, Adsorption Kinetics, Free Fatty Acids, Regenerated Clay, Soy Oil

? Saeed, A., Akhter, M.W. and Iqbal, M. (2005), Removal and recovery of heavy metals from aqueous solution using papaya wood as a new biosorbent. *Separation and Purification Technology*, **45** (1), 25-31.

Full Text: [S\Sep Pur Tec45, 25.pdf](S/Sep%20Pur%20Tec45,%2025.pdf)

Abstract: Papaya wood was evaluated as a new biosorbent of heavy metals. On contacting 10 mg l−l copper(II), cadmium(II) and zinc(II) solutions with 5 g l−1 papaya wood, during shake flask contact time of 60 min, the respective metal removal was noted to be 97.8, 94.9 and 66.8%. Sorption was most efficient at pH 5. Metal ion biosorption increased as the ratio of metal solution to the biomass quantity decreased. Conversely, biosorption/g biosorbent decreased as the quantity of biomass increased. The increase in initial metal ion concentration was associated with steep increase in biosorption at lower concentrations, progressively reaching towards plateau at higher metal concentrations. At equilibrium, the affinity of papaya wood to biosorb metals was in the order of copper(II) > cadmium(II) > zinc(II), which remained the same during the testing of variables of different factors. The biosorption data perfectly fit the Langmuir adsorption isotherms model with 0.99 regression coefficient (*r*2) for all the metals. The fit on Freundlich adsorption isotherms model was acceptable but not as good. The biosorption kinetics studies indicated that the data followed the second-order reaction with *r*2 of 0.99. The first-order reaction was not applicable to the data. The metal-loaded papaya wood was completely desorbed with 0.1N HCl. During repeated biosorption–desorption for five cycles, no loss in the efficiency of copper(II) and cadmium(II) removal from their respective solutions and the metal-loaded biomass was noted. The study points to the potential of a novel use of papaya wood, itself a cause of environmental degradation and otherwise of no utility, for the treatment of wastewaters contaminated with heavy metals.

Keywords: *Carica Papaya*, Biosorption, Heavy Metal Removal, Sorption Isotherm, Biosorption Kinetics, Desorption

? Leyva-Ramos, R., Bernal-Jacome, L.A., and Acosta-Rodriguez, I. (2005), Adsorption of cadmium(II) from aqueous solution on natural and oxidized corncob. *Separation and Purification Technology*, **45** (1), 41-49.

Full Text: [2005\Sep Pur Tec45, 41.pdf](2005/Sep%20Pur%20Tec45,%2041.pdf)

Abstract: Adsorption isotherms were determined experimentally for Cd(II) adsorption from aqueous solution onto natural and oxidized corncob in a batch adsorber. The adsorption capacity of natural corncob was increased 10.8 and 3.8 times when the corncob was oxidized with citric acid (CA) and nitric acid (NA), respectively. The Cd(II) ions were adsorbed mainly to the carboxylic sites since the adsorption capacity increased directly proportionally to the concentration of carboxylic sites in the corncob. The effect of the solution pH in the adsorption isotherm on natural and corncob modified with CA was assessed and it was observed that the adsorption capacity of Cd(II) on corncob depends considerably on the solution pH, Cd(II) was not adsorbed at pH less than 2 and the adsorption capacity was increased five times while the solution pH increased from 3 to 6. The adsorption of Cd(II) on corncob was reversible and the Cd(II) desorbed almost completely while reducing solution pH from 6 to 2. The adsorption capacity of natural and modified corncob was increased slightly by augmenting the temperature. By performing mass balances of ions, it was corroborated that the adsorption is mainly due to ion exchange.

Keywords: Adsorption, Cadmium(II), Carboxylic Sites, Citric Acid Oxidation, Natural Corncob, Oxidized Corncob, Activated Carbons, Waste-Water, Metal-Ions, Surface-Chemistry, Heavy-Metals, Removal, Sorption, Equilibrium, Biosorption, Isotherms

? Lao, C., Zeledón, Z., Gamisans, X. and Solé, M. (2005), Sorption of Cd(II) and Pb(II) from aqueous solutions by a low-rank coal (leonardite). *Separation and Purification Technology*, **45** (2), 79-85.

Full Text: [2005\Sep Pur Tec45, 79.pdf](2005/Sep%20Pur%20Tec45,%2079.pdf)

Abstract: The sorption of Cd(II) and Pb(II) from aqueous solutions by a low-cost sorbent (leonardite) was investigated. The effect of pH, contact time and initial metal concentration was studied. The sorption of the two metals was pH dependant, the optimum range being 5–6. Batch kinetic studies showed that equilibrium was reached after 2 h. The sorption data were correlated with the Langmuir and Freundlich adsorption models. The maximum adsorption capacities obtained from the Langmuir isotherms were 0.45 mmol g−1 (50.6 mg g−1) and 1.21 mmol g−1 (250.7 mg g−1) for Cd(II) and Pb(II), respectively.

An extensive study of the competitive adsorption between both metals was performed under the same conditions of the individual experiments. The extended Langmuir model was used to fit the experimental data to a series of 3D response surfaces. For binary systems, the maximum adsorption capacities of Cd(II) and Pb(II) were calculated as 0.27 mmol g−1 (30.6 mg g−1) and 0.57 mmol g−1 (118.7 mg g−1), respectively. Cd(II) adsorption was found to be more sensitive than Pb(II) to the presence of a competitive sorbate.

Keywords: Adsorption, Leonardite, Cadmium, Lead

? Otero, M., Zabkova, M. and Rodrigues, A.E. (2005), Comparative study of the adsorption of phenol and salicylic acid from aqueous solution onto nonionic polymeric resins. *Separation and Purification Technology*, **45** (2), 86-95.

Full Text: [2005\Sep Pur Tec45, 86.pdf](2005/Sep%20Pur%20Tec45,%2086.pdf)

Abstract: Phenolic compounds are undesirable pollutants in the environment, specifically in aquatic media. Salicylic acid is a phenolic compound, and, together with phenol, which is its precursor, it is present in wastewaters from different industries. Adsorption being one of the most common ways for these wastewaters treatment, the comparison of the adsorption on these compounds onto two different polymeric resins (Amberlite XAD16 and Duolite S861) was the aim of this work. The adsorptive behavior of these resins has been compared in batch and fixed bed operation. Langmuir isotherm model was used to fit equilibrium data. In order to ascertain the fixed bed implementation of the adsorbents, adsorption runs were carried out at laboratory scale and the effects of temperature and flow-rate were addressed. For modelling, the adsorption kinetics a linear driving force (LDF) approximation was used. The LDF rate constant accounting for macropore diffusion and adsorption and the film mass transfer resistance were grouped in an overall mass transfer coefficient. According to the results, the capacity of Duolite S861 for phenol adsorption (96.13 mg g−1) was slightly higher than for Amberlite XAD (81.68 mg g−1). On the contrary, Amberlite XAD salicylic acid adsorptive capacity (85.06 mg g−1) was nearly double than that of Duolite S861 (43.01 mg g−1). From a kinetic point of view, for both the resins the overall mass transfer coefficient was higher when adsorbing phenol than salicylic acid. Nevertheless, in the temperature range studied (293–333 K), the separation parameter for thermal parametric pumping purification is larger for Amberlite XAD16 for both phenol and salicylic acid.

Keywords: Phenol, Salicylic Acid, Polymeric Resins, Adsorptive Purification, Fixed Bed Adsorption

? Deliyanni, E.A. and Matis, K.A. (2005), Sorption of Cd ions onto akaganéite-type nanocrystals. *Separation and Purification Technology*, **45** (2), 96-102.

Full Text: [2005\Sep Pur Tec45, 96.pdf](2005/Sep%20Pur%20Tec45,%2096.pdf)

Abstract: The aim of this paper is to remove cadmium ions from aqueous solutions by sorption onto synthetic akaganéite-type nanocrystals. This material was shown to be a promising inorganic adsorbent due to its favourite characteristics. Synthetic akaganéite was prepared in the laboratory according to a new method. In this paper, the effects of adsorbent amount, initial cadmium concentration, pH value of solution, concentration of background electrolyte ions and temperature variation on the treatment process of cadmium removal by akaganéite were investigated. Typical adsorption isotherms (Freundlich and Langmuir) were determined for the mechanism of sorption process. X-ray photoelectron spectroscopy (XPS) analysis also revealed useful information.

Keywords: Cadmium Removal, Metal Cations, Adsorbent, Iron Oxides, Industrial Wastewater, Effluents

? Deliyanni, E.A. and Matis, K.A. (2005), Kinetic and equilibrium modelling of lead(II) sorption from water and wastewater by polymerized banana stem in a batch reactor. *Separation and Purification Technology*, **45** (2), 131-140.

Full Text: [2005\Sep Pur Tec45, 131.pdf](2005/Sep%20Pur%20Tec45,%20131.pdf)

Abstract: The aim of this research work was a kinetic and equilibrium study of the sorption of lead(II) ions from water and wastewater by formaldehyde polymerized banana stem containing sulphonic acid groups. The adsorbent was characterized using surface area analyzer, infrared spectroscopy and scanning electron microscopy measurements. The surface charge and the acid groups of the adsorbent were determined using potentiometric and acid–base titrations, respectively. Batch experiments were performed under kinetic and equilibrium conditions. The optimum pH range for the maximum removal of lead(II) was 5–9. The maximum adsorption of 98.5 and 89.9% took place for an initial concentration of 10 and 25 mg/l, respectively, at pH 6.0. The sorption process occurred in two stages: external mass transport occurred in the early stage and intraparticular diffusion occurred in the long-term stage. The diffusion coefficients, energies of activation and entropies of activation for both processes were calculated to determine the theoretical behaviour of the sorption process. In the external mass transfer process, the diffusion coefficient increases with increasing initial concentration while in the intraparticle diffusion process, the diffusion coefficient decreases with increasing initial concentration. The temperature dependence indicates the endothermic nature of adsorption process. The Langmuir, Freundlich and Redlich–Peterson isotherm models were tried to represent the equilibrium data of lead(II) adsorption. The data fitted very well to the Freundlich isotherm model in the studied concentration range of lead(II) adsorption. Quantitative removal of 10.0 mg/l lead(II) in 50 ml of battery manufacturing wastewater by 125 mg of the adsorbent was observed at pH 6.0. The adsorbent was suitable for repeated use (for more than four cycles) without noticeable loss of capacity.

Keywords: Adsorption, Lead(II) Removal, Polymerized Banana Stem, Kinetics, Mass Transport, Isotherm Constants

? Raman, G., Jayaprakasha, G.K., Cho, M., Brodbelt, J. and Patil, B.S. (2005), Rapid adsorptive separation of citrus polymethoxylated flavones in non-aqueous conditions. *Separation and Purification Technology*, **45** (2), 147-152.

Full Text: [2005\Sep Pur Tec45, 147.pdf](2005/Sep%20Pur%20Tec45,%20147.pdf)

Abstract: Flavanoids exist as secondary plant metabolites, which displays a wide variety of biological effects. The polymethoxylated flavones, such as nobiletin and tangeretin, present in *Citrus reticulata* peels are of great interest due to their pharmacological effects. Separation and isolation of these structurally very similar flavones has been achieved by using commercially available ion exchange resins. The strong cation exchange resin [H+] selectively adsorbs the tangeretin and other phenolic compounds present in the matrix in comparison to the hexamethoxylated flavone, i.e. nobiletin. The cation exchange resin can be used successfully to isolate nobiletin and tangeretin from a plant extract. Purity of the isolated compounds was monitored by HPLC using a C-18 column with photometric detection at 280 nm. The structures of the isolated compounds have been confirmed by NMR and tandem mass spectrometry.

Keywords: Citrus, Adsorptive Separation, Polymethoxylated Flavones

? Ho, Y.S., Harouna-Oumarou, H.A., Fauduet, H. and Porte, C. (2005), Kinetics and model building of leaching of water-soluble compounds of *Tilia* sapwood. *Separation and Purification Technology*, **45** (3), 169-173.

Full Text: [2005\Sep Pur Tec45, 169.pdf](2005/Sep%20Pur%20Tec45,%20169.pdf) [S\Sep Pur Tec-Ho.pdf](S/Sep%20Pur%20Tec-Ho.pdf)

Abstract: The kinetics of the leaching of water-soluble compounds of Tilia sapwood was investigated. A batch leaching model, based on the assumption of a second-order mechanism for the leaching, was developed to predict the rate constant of leaching, the saturated leaching capacity, and the initial leaching rate with various leaching temperatures. The rate constant is a function of the temperature, and the leaching of water-soluble compounds of Tilia sapwood is an endothermic process. In addition, the activation energy of leaching was also determined based on the second-order rate constants of the leaching.

Keywords: Kinetics, Second-Order, Leaching, Tilia Sapwood, Extraction, Wood

? Kim, S.I., Aida, T. and Niiyama, H. (2005), Binary adsorption of very low concentration ethylene and water vapor on mordenites and desorption by microwave heating. *Separation and Purification Technology*, **45** (3), 174-182.

Full Text: [2005\Sep Pur Tec45, 174.pdf](2005/Sep%20Pur%20Tec45,%20174.pdf)

Abstract: Microwave heating can be applied to regeneration of an adsorbent in the removal of volatile organic compounds in very low concentration. In this study, binary adsorption of ethylene and water vapor on mordenites (MORs) was carried out for very low concentration of ethylene. Microwave was irradiated to the adsorbent bed and the effect of adsorbed water on the heating of MORs and the desorption of the adsorbates were investigated. In the binary adsorption, all MORs showed linear adsorption for ethylene in very low concentration range and the amounts of adsorbed ethylene decreased as compared with the adsorption of the single component. NaMOR was heated up rapidly and to high temperature by microwave irradiation under both dry and humid conditions as compared with HMORs. Due to the strong adsorption of water on NaMOR, the coexisting water vapor hindered the adsorption of ethylene, but promoted microwave heating. In microwave heating of NaMOR after pre-adsorption of ethylene and water, ethylene was concentrated maximally about nine times as high as that in initial feed.

Keywords: Binary Adsorption, Regeneration by Microwave Heating, Very Low Concentration Ethylene, Mordenite, Hydrophilic And Hydrophobic

? Bayramoğlu, G. and Arıca, M.Y. (2005), Ethylenediamine grafted poly(glycidylmethacrylate-co-methylmethacrylate) adsorbent for removal of chromate anions. *Separation and Purification Technology*, **45** (3), 192-199.

Full Text: [2005\Sep Pur Tec45, 192.pdf](2005/Sep%20Pur%20Tec45,%20192.pdf)

Abstract: The removal of chromate anions (CrO42−) from aqueous solutions under different experimental conditions using cross-linked poly(glycidylmethacrylate-co-methylmethacrylate), poly(GMA-co-MMA), adsorbent was investigated in this study. The epoxy group containing adsorbent in the beads form was prepared from glycidylmethacrylate and methylmethacrylate via suspension polymerization. The epoxy groups of the poly(GMA-co-MMA) beads were used for grafting with ethylenediamine to prepare specific adsorbent (poly(GMA-co-MMA)-ED) for CrO42− anions removal from aqueous solutions. Adsorption equilibrium was achieved in approximately 120 min. The removal was favored at low pH, with a maximum adsorption at pH 2.0. Isotherm studies showed that CrO42− anions could be effectively removed by poly(GMA-co-MMA)-ED beads. The maximum adsorption capacities of the poly(GMA-co-MMA) and poly(GMA-co-MMA)-ED beads were 0.044 and 0.441 mmol CrO42− anions/g of dry adsorbents, respectively. The experimental data of the adsorption equilibrium from CrO42− anions aqueous solution correlated well with the Langmuir–Freundlich isotherm model. The experimental data were analyzed using the first- and the second-order kinetic models. The rate constants of adsorption for both kinetics models have been calculated. The second-order model provides the best correlation of the data. Desorption experiments show that the process of adsorption of CrO42− anions was reversible and the adsorbent was easily regenerated with 0.1 M NaOH up to 96% recovery.

Keywords: Beads, Adsorption, Heavy Metal Removal, CrO42- Anions, Kinetic Characterization

? Ribeiro, M.H.L. and Ribeiro, I.A.C. (2005), Recovery of erythromycin from fermentation broth by adsorption onto neutral and ion-exchange resins. *Separation and Purification Technology*, **45** (3), 232-239.

Full Text: [2005\Sep Pur Tec45, 232.pdf](2005/Sep%20Pur%20Tec45,%20232.pdf)

Abstract: Erythromycin was produced by Saccharopolyspora erythraea in batch mode. Selective adsorption was the method chosen to enable the recovery of erythromycin from growth media. The following sorbents were used: neutral resins (XAD-4, XAD-7 and XAD-16) and ion-exchange resins, Amberlite™ IRA-410 (anionic resin) and Amberlite™ IR-120 (cationic resin). A mathematical kinetic model for the adsorption of erythromycin, from fermentation media, versus time, on these resins was used.

The maximum erythromycin adsorption from fermentation media, at 303 K, was attained with XAD-16 (0.38 mmol/g), IR-120 (0.35 mmol/g) and XAD-7 (0.28 mmol/g) resins and a removal higher than 70% (m/v) was achieved with low sorbent loads (less than 1%, m/v). In addition, XAD-7 resin showed a better performance when it was considered the adsorption per unit of surface area (1.22×10−3 mmol/m2).

For every solute/sorbent system tested, adsorption equilibrium was attained in less than 3 h contact. The adsorption data for the sorbents XAD-16 and IRA-120 resins are correlated with Freundlich and Langmuir models.

The thermodynamic parameters such as ΔHads, ΔSads and ΔGads were calculated to predict the nature of adsorption. The positive value of enthalpy (6 kJ/mol) suggest that the original salt in the resin is bound strongly, while the positive value of entropy (54 J/mol K) means that liberation of the salt into the solution is entropically favorable, and the favorable entropy drives the overall process, with a free energy of adsorption of −10 kJ/mol.

Keywords: Erythromycin, Fermentation, Saccharopolyspora Erythraea, Adsorption, Neutral Resins, Ion-Exchange Resins

? Adam, O., Bitschené, M., Torri, G., De Giorgi, F., Badot, P.M. and Crini, G. (2005), Studies on adsorption of propiconazole on modified carbons. *Separation and Purification Technology*, **46** (1-2), 11-18.

Full Text: [2005\Sep Pur Tec46, 11.pdf](2005/Sep%20Pur%20Tec46,%2011.pdf)

Abstract: The adsorption capacity and kinetics of propiconazole in aqueous solution using untreated and treated activated carbons as adsorbents have been studied, providing new experimental data at different temperatures which were obtained using the bottle-point method. Untreated carbon was oxidized with HNO3, H2O2, NaOCl and NaOH to produce a series of samples with different surface chemical properties. The surface chemistry was characterized by the determination of the point of zero charge. It was found that the physical morphology of the sample is affected by the strength of the oxidizing agent and the operating conditions. The surface chemistry of the activated carbon plays a key role in pollutant adsorption performance. Results of sorption experiments showed that carbon modified with NaOH is the best material for the adsorption of propiconazole at pH 6.5. Sorption of propiconazole reached equilibrium in 120 min. The maximum adsorption onto untreated activated carbon was 101 mg/g. As expected, the adsorption increased with increasing temperature. Adsorption kinetics obeyed a second-order kinetic model.

Keywords: Activated Carbon, Activated Carbon, Adsorbents, Adsorption, Adsorption Capacity, Aqueous-Solution, Aromatics, Capacity, Carbon, Chemical, Chemical Properties, Determination, Dye, Equilibrium, Functional-Groups, H2O2, Heavy-Metals, HNO3, Key, Kinetic, Kinetic Model, Kinetics, Low-Cost Adsorbents, Model, Modified, Morphology, Oxidizing, P-Nitrophenol, Performance, pH, Pollutant, Properties, Propiconazole, Sorption, Surface, Surface Chemistry, Surface-Chemistry, Temperature, Waste-Water Treatment, Zero Charge

? Machida, M., Yamazaki, R., Aikawa, M. and Tatsumoto, H. (2005), Role of minerals in carbonaceous adsorbents for removal of Pb(II) ions from aqueous solution. *Separation and Purification Technology*, **46** (1-2), 88-94.

Full Text: [2005\Sep Pur Tec46, 88.pdf](2005/Sep%20Pur%20Tec46,%2088.pdf)

Abstract: Adsorptive removal of Pb(II) ions from aqueous solution onto a non-activated charcoal (CC) of oak wood origin was studied in comparison with an activated carbon of coal origin. The adsorption capacity for Pb(II) of the non-activated charcoal increased significantly with deceasing particle diameter, whereas the activated carbon (AC) exhibited approximately constant capacity for Pb(II) adsorption as a function of particle size. Adsorption to the ashes prepared from the non-activated charcoal and the activated carbon was also investigated to examine the role of mineral ash. Although the ash from the activated carbon did not show any Pb(II) adsorption, the ash from the charcoal was very effective for Pb(II) adsorption. Furthermore, Pb(II) was hardly adsorbed when the ash was removed from the non-activated charcoal by acid treatment. Based on the results, the adsorption sites for Pb(II) are considered to be acidic surface functional groups on the external and internal surfaces for the activated carbon, mineral ash containing oxides of manganese and magnesium exposed on the external surface are dominantly responsible for the Pb(II) adsorption for the non-activated charcoal.

Keywords: Heavy Metal Ions, Charcoal, Activated Carbon, Ash, Adsorption

? Purakayastha, P.D., Pal, A. and Bandyopadhyay, M. (2005), Sorption kinetics of anionic surfactant on to waste tire rubber granules. *Separation and Purification Technology*, **46** (3), 129-135.

Full Text: [2005\Sep Pur Tec46, 129.pdf](2005/Sep%20Pur%20Tec46,%20129.pdf)

Abstract: The efficiency of a locally available very low cost waste tire rubber granule in removing anionic surfactant (AS) by adsorption process was evaluated. As a representative member of AS sodium dodecyl sulfate (abbreviated as SDS) was used. It was found that in the batch experiment conducted at 2.0 mg/l initial concentration of SDS, rubber granules could remove up to 92% of SDS from wastewater. Kinetic profiles under various conditions were developed. The equilibrium time was found to be 6 h. Reaction rate constants (forward, reverse and overall) were determined for different initial concentrations of SDS by approximating the kinetic data to the first-order reversible kinetic model. Pore and film diffusion coefficients were determined from the half-time equations and film diffusion appeared to be rate limiting. This was further supported by multiple interruption tests.

Keywords: Adsorption, Anionic Surfactant, Kinetic Studies, Diffusion Coefficient, Rate-Limiting Process

? Sprynskyy, M., Lebedynets, M., Zbytniewski, R., Namieśnik, J. and Buszewski, B. (2005), Ammonium removal from aqueous solution by natural zeolite, Transcarpathian mordenite, kinetics, equilibrium and column tests. *Separation and Purification Technology*, **46** (3), 155-160.

Full Text: [2005\Sep Pur Tec46, 155.pdf](2005/Sep%20Pur%20Tec46,%20155.pdf)

Abstract: The scope of this study was ammonium ions removal from synthetic aqueous solutions by raw and pretreated natural zeolite, Transcarpathian mordenite under static and dynamic conditions. The cation exchange capacity of the Transcarpathian mordenite regarding ammonium ions was evaluated as 1.64 meq/g at 1000 mg/l initial NH4–N concentration. The dynamic exchange capacity exceeded one estimated in equilibrium study at the same initial concentration that may be conditioned by the constant removal of ion exchange products. Ammonium uptake rate was controlled by particle diffusion with diffusion coefficients determined in the range of 0.7–3.6×10−12 m2/s. Efficiency of ammonium sorption may be improved by slowing down of initial solution rate in the column test and non-significantly by NaCl and HCl pretreatment of the mordenite. Ammonium sorption by the mordenite increased from the coarser to the finer fraction but this dependence became weaker to low flow rates. It was established that hydrogen ions displaced exchangeable cations on the mordenite in distilled water and hydrochloric acid with destroy of the zeolite framework structure in the last case. NH4+-ions removal from aqueous solutions occurs mainly by ion exchange with Na+- and Ca2+-ions at the practically equal parts of them because of the weakest affinity of the mordenite to these cations.

Keywords: Mordenite, Ion Exchange, Ammonium Removal, Kinetic and Column Tests

? Yang, W.B., Li, A.M., Zhang, Q.X., Fei, Z.H. and Liu, F.Q. (2005), Adsorption of 5-sodiosulfoisophthalic acids from aqueous solutions onto acrylic ester polymer YWB-7 resin. *Separation and Purification Technology*, **46** (3), 161-167.

Full Text: [2005\Sep Pur Tec46, 161.pdf](2005/Sep%20Pur%20Tec46,%20161.pdf)

Abstract: A new acrylic ester polymer YWB-7 resin was prepared and systematically characterized. The adsorption properties of YWB-7 resin were compared with those of the commercial Amberlite XAD-7, Diaion HP2MG and hypercrosslinked polymer NDA-150 resins. Both surface area and micropore area of YWB-7 resin are larger than those of XAD-7 and HP2MG resins. The Freundlich isotherm equation was successfully employed to describe the adsorption phenomena. The adsorption experiments showed that the NDA-150 resin has the largest adsorption capacity to 5-sodiosulfoisophthalic acid sodium salt (SIPA) from aqueous solutions without methanol, but the adsorption capacity decreases significantly in SIPA solutions with methanol (5%). In contrast, methanol in SIPA solution has little effect on the adsorption capacity of acrylic ester resins. The adsorption capacities of SIPA on YWB-7 resin in the tested range are always larger than those on XAD-7 and HP2MG resins. Hydrogen bonding is believed to be the predominant interaction between acrylic ester resin and SIPA in the adsorption process and the increasing acid concentration impels the formation of hydrogen bonding to some extent.

Keywords: Acrylic Ester Resin, 5-Sodiosulfoisophthalic Acid Sodium Salt (SIPA), Hydrogen Bonding, Hydrophobic Interaction, Adsorption

? Inglezakis, V.J., Zorpas, A.A., Loizidou, M.D. and Grigoropoulou, H.P. (2005), The effect of competitive cations and anions on ion exchange of heavy metals. *Separation and Purification Technology*, **46** (3), 202-207.

Full Text: [2005\Sep Pur Tec46, 202.pdf](2005/Sep%20Pur%20Tec46,%20202.pdf)

Abstract: In the present study, the effects of competitive cations NH4+, K+, Ca2+, Na+, Mg2+ and Li+ and co-anions Cl- and Br- on ion exchange of heavy metals Pb2+, Fe3+, Cr3+ and Cu2+ on clinoptilolite is examined. The presence of cations and anions in the solutions of heavy metals is reducing the removal of the latter and the order of decreasing negative effect is the following: NH4+ > Mg2+ > Ca2+ > Na+ > K+ > Li+ and Br- > Cl- for Pb2+ NH4+ > K+ > Ca2+ > Na+, Mg2+ approximate to Li+ and Br- > Cl- for Cr3+, NH4+ > K+ > Na+ > Ca2+ > Li+ > Mg2+ and Cl- > Br- for Fe3+ and Ca2+ > NH4+ > Li+ > K+ > Na+ > Mg2+ and Cl- > Br- for Cu2+. In all cases, the selectivity of clinoptilolite for heavy metals is the following: Pb2+ > Fe3+ > Cr3+ >= Cu2+. (C) 2005 Elsevier B.V. All rights reserved.

Keywords: Clinoptilolite, Heavy Metals, Ion Exchange, Competitive Cations, Anion Complexes, Natural Clinoptilolite, Sieve Properties, Zeolites, Removal, Sedimentary, Mordenite, Sorption, Water

? Atia, A.A., Donia, A.M. and Shahin, A.E. (2005), Studies on the uptake behavior of a magnetic Co3O4-containing resin for Ni(II), Cu(II) and Hg(II) from their aqueous solutions. *Separation and Purification Technology*, **46** (3), 208-213.

Full Text: [2005\Sep Pur Tec46, 208.pdf](2005/Sep%20Pur%20Tec46,%20208.pdf)

Abstract: A magnetic chelating resin was obtained from polymerization of glycidyl methacrylate in the presence of divinylbenzene as a crosslinker and finely divided magnetic particles of Co3O4. The resin obtained was investigated by means of XRD, IR, magnetic susceptibility and DTA/TGA thermal analysis. The measurements showed that the particles of Co3O4 became completely coated with a film of the resin. The embedded metal oxide particles impart magnetic properties to the resin in addition to increasing the chelating active sites on the surface. The resin obtained was modified with amine functionality and evaluated towards the uptake of Hg2+, Cu2+ and Ni2+ from their aqueous solutions. Various factors affecting the uptake behaviour such as contact time, pH and initial concentration of the metal ions were investigated. Uptake values of 2.10, 2.00 and 1.10 mmol/g were recorded for Hg2+, Cu2+ and Ni2+, respectively. The adsorption results were found to fit Langmuir model. The modified resin displays higher uptake capacity compared to the metal oxide-free resin. The loaded resin with metal ions was regenerated to efficiency of 97.5% using 1 M H2SO4.

Keywords: Heavy Metals, Chelating Resins, Metal Oxides, Adsorption, Recovery

? Wu, F.C., Tseng, R.L. and Juang, R.S. (2005), Preparation of highly microporous carbons from fir wood by KOH activation for adsorption of dyes and phenols from water. *Separation and Purification Technology*, **47** (1-2), 10-19.

Full Text: [2005\Sep Pur Tec47, 10.pdf](2005/Sep%20Pur%20Tec47,%2010.pdf)

Abstract: The carbonaceous adsorbents with controllable pore sizes were prepared from carbonized fir wood (i.e., char) by KOH and steam activation. Pore properties of the carbons including the BET surface area, pore volume, pore size distribution, and pore diameter were characterized from N2 isotherms. Through varying KOH/char ratio from 0.5 to 6, the KOH-activated carbons exhibited the surface area ranging from 891 to 2794 m2 g-1 with a fraction of micropore volume of 0.76-0.82. On the other hand, carbons activated by steam at 900°C for 5 and 7 h had a surface area of 1016 and 1131 m2 g-1 with a fraction of micropore volume of 0.51 and 0.48, respectively. The kinetics of adsorption of methylene blue, basic brown 1, acid blue 74, 2,4-dichlorophenol, 4-chlorophenol, p-cresol, and phenol from water on all the carbons studied were examined to check their chemical characteristics. The effective particle diffusivities within carbon particles were also evaluated. (C) 2005 Elsevier B.V. All rights reserved.

Keywords: Fir Wood, Activated Carbons, KOH Activation, Steam Activation, Physical Properties, Adsorption Kinetics, Liquid-Phase Adsorption, Surface-Area, Physical Activation, Pore Structure, Plum Kernels, Sorption, Adsorbents, Diffusion, Porosity, Shell

? Saffaj, N., Persin, M., Alami Younssi, S., Albizane, A., Bouhria, M., Loukili, H., Dach, H. and Larbot, A. (2005), Removal of salts and dyes by low ZnAl2O4–TiO2 ultrafiltration membrane deposited on support made from raw clay. *Separation and Purification Technology*, **47** (1-2), 36-42.

Full Text: [2005\Sep Pur Tec47, 36.pdf](2005/Sep%20Pur%20Tec47,%2036.pdf)

Abstract: This paper reports the dynamic characterizations of a ZnAl2O4–TiO2 membrane deposited on a macroporous support prepared from Moroccan clay coated with a zirconia microfiltration interlayer. The water permeability of the membrane is 0.26×10−10 m s−1 Pa−1, its thickness is less than 700 nm with an average pore diameter of 5 nm, and a cut off about 4500 Da. The investigations of filtrations performed with different salts (NaCl, CaCl2, Na2SO4, CaSO4) prove the rejection mechanism is governed by a Donnan exclusion of the coion. Results obtained with solutions charged in heavy metal ions such as CrIII and synthetic dyes are very promising to consider the use of this membrane in depolluting filtration processes.

Keywords: Multilayer, Ultrafiltration, Electrical Interactions, Colour Removal, Heavy Metals

? Tunali, S., Akar, T., Özcan, A.S., Kiran, I. and Özcan, A. (2006), Equilibrium and kinetics of biosorption of lead(II) from aqueous solutions by *Cephalosporium aphidicola*. *Separation and Purification Technology*, **47** (3), 105-112.

Full Text: [2006\Sep Pur Tec47, 105.pdf](2006/Sep%20Pur%20Tec47,%20105.pdf)

Abstract: Biosorption of lead(II) onto *Cephalosporium aphidicola* was examined and the effects of pH, contact time, biosorbent and lead(II) concentrations and temperature on biosorption were investigated. The nature of the possible cell and metal ion interactions was examined by the FTIR technique. The lead(II) biosorption was fast and equilibrium was attained within 30 min. It was found that the overall biosorption process was best described by pseudo-second-order kinetic model. Data obtained from batch studies fitted well with the Langmuir, Freundlich and Dubinin–Radushkevich (D–R) isotherm models. Maximum adsorption capacity (*q*max) of lead(II) onto *C. aphidicola* was 4.46×10−4 mol g−1. The change of free energy, enthalpy and entropy of the biosorption of lead(II) onto *C. aphidicola* are −1.387 kJ mol−1 at 20 °C, +30.54 kJ mol−1 and +109.43 J K−1 mol, respectively.

Keywords: Biosorption, Lead, Fungus, Isotherms, Kinetics

? Üçer, A., Uyanik, A. and Aygün, Ş.F. (2006), Adsorption of Cu(II), Cd(II), Zn(II), Mn(II) and Fe(III) ions by tannic acid immobilised activated carbon. *Separation and Purification Technology*, **47** (3), 113-118.

Full Text: [2006\Sep Pur Tec47, 113.pdf](2006/Sep%20Pur%20Tec47,%20113.pdf)

Abstract: In this study, adsorption of the toxic metal ions onto tannic acid immobilised activated carbon was investigated depending on pH, contact time, carbon dosage, adsorption capacity and adsorption isotherms by employing batch adsorption technique. In the optimum conditions, the percent adsorption of metal ions were determined for Cu(II) (23.5%), Cd(II) (17.8%), Zn(II) (14.0%), Mn(II) (11.3%) and Fe(III) (17.9%) and results were compared with that of the untreated activated carbon. The order of affinity based on uptake by tannic acid immobilised activated carbon and untreated activated carbon was the same as Cu(II) > Fe(III) > Cd(II) > Zn(II) > Mn(II), but differing in the adsorption capacities. In the studied conditions, the adsorption capacity of tannic acid immobilised activated carbon followed the order of Cu(2.23) > Fe(1.77) > Cd(1.51) > Zn(1.23) > Mn(1.13) in single systems and Fe(1.56) > Cd(1.48) > Zn(1.19) > Mn(1.11) in Cu(II) coupled competitive systems. The adsorption data was correlated to Langmuir and Freundlich isotherm for each metal ion and the data fitted better to the Langmuir isotherm model. A combined ion exchange, complex formation and surface adsorption processes were believed the major adsorption mechanisms playing role in the binding of metal ions. Adsorbed metal ions were effectively desorbed (90.2–98.4%) by using 0.1 M HCl without destroying the modified adsorbent.

Keywords: Adsorption, Immobilisation, Modification, Heavy Metal Ions, Activated Carbon, Tannic Acid

? Shukla, S.R., Pai, R.S. and Shendarkar, A.D. (2006), Adsorption of Ni(II), Zn(II) and Fe(II) on modified coir fibres. *Separation and Purification Technology*, **47** (3), 141-147.

Full Text: [2006\Sep Pur Tec47, 141.pdf](2006/Sep%20Pur%20Tec47,%20141.pdf)

Abstract: The potential of a cheap lignocellulosic fibre, coir was assessed for removal of heavy metal ions like Ni(II), Zn(II) and Fe(II) from their aqueous solutions. The fibre was also chemically modified by oxidising it with hydrogen peroxide for use as adsorbent. Langmuir type adsorption was followed by the coir fibres. The modified coir fibres gave higher metal ion uptake as 4.33, 7.88 and 7.49 mg/g for Ni(II), Zn(II) and Fe(II), respectively, against 2.51, 1.83 and 2.84 mg/g for the unmodified coir fibres. The metal ion uptake values decreased with lowering of pH. The desorption efficiency, regenerative and reuse capacity of these adsorbents were also assessed for three successive adsorption–desorption cycles. The adsorptive capacity was retained only when regeneration with dilute NaOH solution is carried out as an intermediate step after desorption. An ion-exchange mechanism has been proposed for the enhanced metal ion uptake on modified coir.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption-Desorption, Aqueous-Solution, Cadmium, Capacity, Cations, Cellulose, Coir, Cu(II), Desorption, Efficiency, Fe(II), Heavy Metal, Heavy Metal Ions, Heavy-Metal Removal, Hydrogen, Hydrogen Peroxide, Ion, Ion Exchange, Ion Removal, Langmuir, Mechanism, Metal Ions, Modified, Oxidation, Peroxide, pH, Regeneration, Removal, Reuse, Sawdust, Sorption, Uptake, Water

? Aksu, Z. and Çağatay, Ş.Ş. (2006), Investigation of biosorption of Gemazol Turquise Blue-G reactive dye by dried *Rhizopus arrhizus* in batch and continuous systems. *Separation and Purification Technology*, **48** (1), 24-35.

Full Text: [2006\Sep Pur Tec48, 24.pdf](2006/Sep%20Pur%20Tec48,%2024.pdf)

Abstract: Gemazol Turquise Blue-G, a vinyl sulfone mono-azo type reactive dye, containing copper-phtlalocyanine as cromofor group, was removed from its aqueous solution in batch and continuous packed bed sorption systems by using dried *Rhizopus arrhizus* as a biosorbent. Operating variables studied were temperature, initial pH, initial dye concentration and sorbent dosage in the batch stirred system and flow rate and inlet dye concentration in the continuous packed bed. In the batch system, the fungal biomass exhibited the highest dye uptake as 773.0 mg g−1 at 45 °C, at an initial pH value of 2.0, at an initial dye concentration of 812.6 mg l−1 for a biomass dosage of 0.5 g l−1. The Freundlich, Langmuir and Redlich–Peterson adsorption models were used for the mathematical description of the biosorption equilibrium and isotherm constants were evaluated at different temperatures. Equilibrium data fitted well the Langmuir model in the studied concentration (100–800 mg l−1) and temperature (25–45 °C) ranges. Sorption data were fitted to pseudo first-order, pseudo second-order and saturation type kinetic models assuming that the external mas transfer limitations in the system can be neglected. The dye uptake process was found to follow pseudo second-order and saturation type kinetics. The thermodynamic parameters calculated showed that the adsorption process is feasible and has an endothermic character. The effect of operating parameters on the sorption characteristics of *R. arrhizus* in the continuous packed bed was investigated at pH 2.0 and at 25 °C. Data confirmed that the total amount of sorbed dye and column sorption capacity decreased with increasing flow rate and increased with increasing inlet dye concentration. The maximum column biosorption capacity of dried *R. arrhizus* cells was 823.8 mg g−1 at the highest inlet dye concentration of 776.3 mg l−1 at the minimum flow rate of 0.8 ml min−1. Thomas model was applied to experimental column data to determine the characteristic parameters of column useful for process design and to predict the breakthrough curves. The model was found suitable for describing the whole part of dynamic behavior of the column with respect to flow rate and inlet dye concentration.

Keywords: Biosorption, Gemazol Turquise Blue-G, Reactive Dye, *R. Arrhizus*, Continuous Packed Bed

? del Mar de la Fuente García-Soto, M. and Camacho, E.M. (2006), Boron removal by means of adsorption with magnesium oxide. *Separation and Purification Technology*, **48** (1), 36-44.

Full Text: [2006\Sep Pur Tec48, 36.pdf](2006/Sep%20Pur%20Tec48,%2036.pdf)

Abstract: The presence of boron compounds in waters increases in a continuous and parallel way to industrial development. Therefore, their harmful effects on living organisms also increases, especially on plants, since this element manifests an important micronutrient–toxic boron duality. The aim of this study is to investigate the influence of different operation variables within the adsorption process of the boron compounds with magnesium oxide when liquid waste of urban, agricultural or industrial origin is being treated. The results obtained indicate that the process is strongly influenced by the quality of added reagent and by the contact time between the reagent and solution. Moreover, the temperature variable also stands out, as it has a very positive influence, reducing the necessary contact time to obtain specific boron removal yields. On the one hand, it has been observed that this process appears to be inextricably linked to pH. The removal process improves as the pH increases, presenting a maximum at pH value between 9.5 and 10.5, which is where borate ion predominates. The reagent used in the study has an important alkalinising capacity. Due to the fact that the pH of the solutions is situated around this range, it is not necessary to adjust this variable during the process. Therefore, using this reagent is an attractive option. As for the metallic cations that usually accompany boron in industrial waste, it seems that the reagent’s presence also facilitates the removal of these cations and a simultaneous treatment of industrial waste can thus be carried out. Furthermore, interrelationships between the different variables have been established. When the optimum conditions are selected, the process reaches over 95% of boron removal.

Keywords: Adsorption, Boron, Pollution, Removal, Variable Influence

? Coleman, N.J. (2006), Interactions of Cd(II) with waste-derived 11 angstrom tobermorites. *Separation and Purification Technology*, **48** (1), 62-70.

Full Text: [2006\Sep Pur Tec48, 62.pdf](2006/Sep%20Pur%20Tec48,%2062.pdf)

Abstract: Paper recycling gives rise to significant volumes of secondary waste materials which undermine its economic and environmental sustainability. In response to this problem, a waste combustion ash arising from newsprint recycling has been evaluated as a feedstock material for the hydrothermal synthesis of Al-substituted 11 angstrom tobermorites. Highly crystalline tobermorite (NRR-H2O) was obtained from a stoichiometrically optimised mixture of newsprint recycling residue, sodium silicate and calcium oxide, whereas a less well-ordered product (NRR-NaOH) was acquired when sodium hydroxide was also incorporated into the reagent mixture.

Structural disorder within the tobermorite lattice was found to accelerate the kinetics of Cd2+ for Ca2+ ion exchange although had little impact on the total number of available exchange sites per unit formula. The Langmuir isotherm model provided a suitable description for the steady state uptake of Cd2+ by both tobermorite specimens under single metal ion batch sorption conditions, from which, maximum adsorption capacities of 167 and 179 mg g-1 were obtained for NRR-NaOH and NRR-H2O, respectively. (C) 2005 Elsevier B.V. All rights reserved.

Keywords: Calcium Silicate Hydrate, Langmuir Isotherm, Ion Exchange, Hydrothermal Synthesis, Recycling, Calcium Silicates, Crystal-Structure, Real Structure, OD Character, Heavy-Metals, Si-29, Adsorption, Exchange, Substitution, Spectroscopy

? O’Connor, A.J., Hokura, A., Kisler, J.M. Shimazu, S., Stevens, G.W. and Komatsu, Y. (2006), Amino acid adsorption onto mesoporous silica molecular sieves. *Separation and Purification Technology*, **48** (2), 197-201.

Full Text: [2006\Sep Pur Tec48, 197.pdf](2006/Sep%20Pur%20Tec48,%20197.pdf)

Abstract: Mesoporous molecular sieves are promising as adsorbents for purification of biological molecules, such as amino acids, due to their tuneable mesopore sizes and high surface area. In this study, the adsorption of the basic amino acid, lysine, onto MCM-41, a siliceous mesoporous molecular sieve, has been investigated under a range of solution conditions. It was found to adsorb according to a Langmuir-type isotherm with a maximum capacity at pH 6 of 0.21 mmol/g. The extent of adsorption depends strongly on the pH and ionic strength of the adsorbate solution, due to a combination of ion exchange and electrostatic interactions governing the adsorption process.

Keywords: Amino Acid, Adsorption,, Mesoporous Molecular Sieve, MCM-41, Lysine

? Donia, A.M., Atia, A.A., El-Boraey, H.A. and Mabrouk, D.H. (2006), Adsorption of Ag(I) on glycidyl methacrylate/*N*,*N*’-methylene bis-acrylamide chelating resins with embedded iron oxide. *Separation and Purification Technology*, **48** (3), 281-287.

Full Text: [2006\Sep Pur Tec48, 281.pdf](2006/Sep%20Pur%20Tec48,%20281.pdf)

Abstract: Glycidyl methacrylate/*N*,*N*’-methylene bis-acrylamide (GMA/MBA) resins modified by embedded iron oxide (Fe2O3) were prepared. Amino and thiol functionalities were immobilized on the obtained resins. The uptake of Ag(I) by the resins using batch and column techniques was investigated. The oxide-containing resins showed higher uptake values relative to the corresponding oxide-free ones. The uptake of Ag(I) on the resins was found to follow pseudo second-order kinetics. The uptake process was investigated at different temperatures and Δ*H*°, Δ*S*° and Δ*G*° were calculated. Regeneration of the resins was achieved using thiourea, HNO3 and acidified thiourea with HNO3. Regeneration efficiency was found to be 98% over five cycles with no appreciable change in durability.

Keywords: Chelating Resins, Adsorption, Silver, Kinetics, Thermodynamics

? Singh, T.S. and Pant, K.K. (2006), Experimental and modelling studies on fixed bed adsorption of As(III) ions from aqueous solution. *Separation and Purification Technology*, **48** (3), 288-296.

Full Text: [2006\Sep Pur Tec48, 288.pdf](2006/Sep%20Pur%20Tec48,%20288.pdf)

Abstract: This paper deals with the experimental investigation on removal of arsenic [As(III)] ions from drinking water by activated alumina and iron oxide impregnated activated alumina (IOIAA). Effect of inlet flow rate, sorbent bed height and initial As(III) concentration on the adsorption of As(III) from aqueous solution were studied. Increase in throughput volume was observed with increase in bed height whereas inverse relationship of flow rate and initial As(III) concentration with removal of arsenite ions was observed by these sorbents. Compared to activated alumina, iron oxide impregnated activated alumina was found more effective in removing As(III) ions. The dynamics of adsorption process was modelled by bed depth service time (BDST) and pore diffusion model. Adsorption rate constant (ka) was found to increase with increase in flow rate indicating the overall system kinetics was dominated by external mass transfer in the initial part of the adsorption in the column. Critical bed depth (Z0) increased with increase in flow rate for both the adsorbent. Relatively lower critical bed height was observed for As(III) removal onto IOIAA (0.56 cm) compared to AA (1.12 cm) at identical flow rate (0.083 cm3/s). Time required for traveling a unit length of adsorber bed varied from 17,280 to 43,920 s (4.8–12.2 h) and 21,240–54,360 s for AA and IOIAA depending upon the conditions. Pore diffusion model explained the breakthrough behaviour for As(III) removal with a high degree of correlation.

Keywords: Arsenic, Breakthrough Studies, BDST Model, Pore Diffusion Model, Adsorption Zone

? Juang, R.S., Kao, H.C. and Chen, W. (2006), Column removal of Ni(II) from synthetic electroplating waste water using a strong-acid resin. *Separation and Purification Technology*, **49** (1), 36-42.

Full Text: [2006\Sep Pur Tec49, 36.pdf](2006/Sep%20Pur%20Tec49,%2036.pdf)

Abstract: Ion exchange is widely used for the recovery and removal of metals from waste streams in chemical process industries. The removal of Ni(II) from synthetic electroplating waste water using a strong-acid resin in fixed beds was investigated. Besides NiSO4, the water contained NH4Cl and anionic ligands NaH2PO4 and citrate. Batch studies showed that the exchange isotherms were well fitted by the Langmuir equation. Column experiments were performed under different pH values (0.5–5.0), metal concentrations (5.1–11.9 mol/m3), volumetric flow rates (5–12 cm3/min), and bed volumes (3.7–9.8 cm3). The Thomas model that consists of two parameters was applied to describe the breakthrough curves. It was shown that the calculated breakthrough curves agreed well with the measured ones (standard deviation 6%), except the curves before break point obtained at pH > 3.0. The non-zero Ni(II) concentration in the effluent at the early stage of the whole process was ascribable to the presence of anionic ligands. A chemical model that considers possible aqueous complexation reactions was proposed to explain such breakthrough characteristics.

Keywords: Ni(II) Removal, Cation Exchange Resins, Electroplating Waste Water, Fixed Bed

? Donia, A.M., Atia, A.A., El-Boraey, H. and Mabrouk, D.H. (2006), Uptake studies of copper(II) on glycidyl methacrylate chelating resin containing Fe2O3 particles. *Separation and Purification Technology*, **49** (1), 64-70.

Full Text: [2006\Sep Pur Tec49, 64.pdf](2006/Sep%20Pur%20Tec49,%2064.pdf)

Abstract: Two glycidyl methacrylate (GMA) chelating resins were prepared and characterized by IR and thermal analysis (DTA/TGA). The preparation process was carried out through copolymerization of GMA with *N*,*N*’-methylenebisacrylamide cross-linker in presence and absence of iron oxide (Fe2O3). The resins obtained were subsequently treated with ethylenediamine to give the corresponding amine-chelating resins. The resins were characterized by IR and thermal analysis (DTA/TGA). The uptake behaviour of both resins towards Cu(II) ions in aqueous solutions using batch and column techniques was studied. The oxide containing resin (ROA) displayed higher uptake and fast equilibrium time relative to that of oxide free resin (RA). This was attributed to the higher amine group content in ROA due to the stretching of the resin’s film over iron oxide particles. Thermodynamic parameters Δ*H*°, Δ*S*° and Δ*G*° of the uptake process were also calculated. Regeneration of the resins was carried out using 1 M HCl where 98% desorption of the metal ions was obtained. The resins showed good durability for adsorption/desorption over 10 cycles.

Keywords: Adsorption, Copper(II), Glycidyl Methacrylate, Chelating Resins, Thermodynamics

? Coşkun, R., Soykan, C. and Saçak, M. (2006), Adsorption of copper(II), nickel(II) and cobalt(II) ions from aqueous solution by methacrylic acid/acrylamide monomer mixture grafted poly(ethylene terephthalate) fiber. *Separation and Purification Technology*, **49** (2), 107-114.

Full Text: [2006\Sep Pur Tec49, 107.pdf](2006/Sep%20Pur%20Tec49,%20107.pdf)

Abstract: A reactively fibrous adsorbent was prepared by graft copolymerization of methacrylic acid (MAA)/acrylamide (AAm) monomer mixture onto poly(ethylene terephthalate) (PET) fiber and characterized by Fourier transform infrared (FTIR) and thermogravimetric analysis (TGA). The adsorption of Cu(II), Ni(II) and Co(II) ions from aqueous solution by the reactive fiber was examined by batch equilibration technique. The effects of graft yield, pH, adsorption time, initial ion concentrations and adsorption temperature on the adsorption amount of ions were investigated. The reusability and selectivity of the reactive fiber were also investigated. The results showed that the adsorption of the metal ions followed the following order Cu(II) > Ni(II) > Co(II). The adsorption amounts of ions increased with the increase of grafting yield, shaking time, and pH of the medium. The adsorption amounts of Ni(II) and Co(II) ions increased but Cu(II) ions were not affected with increasing adsorption temperature. It was found that the adsorption isotherm of the ions fitted Langmuir-type isotherms. From the Langmuir equation the adsorption capacity was found as 31.25 mg/g fiber for Cu(II), 43.48 mg/g fiber for Ni(II), and 27.17 mg/g fiber for Co(II), respectively. The competitive adsorption tests verified that this reactive fiber possessed good adsorption selectivity for Cu(II) with the coexistence of Co(II) and Ni(II). It can be regenerated by 1 M HNO3 without losing their activity.

Keywords: Grafted Poly(Ethylene Terephthalate) Fiber, Adsorption Properties, Copper(II), Nickel(II), Cobalt(II)

? Wang, Y., Mu, Y., Zhao, Q.B. and Yu, H.Q. (2006), Isotherms, kinetics and thermodynamics of dye biosorption by anaerobic sludge. *Separation and Purification Technology*, **50** (1), 1-7.

Full Text: [2006\Sep Pur Tec50, 1.pdf](2006/Sep%20Pur%20Tec50,%201.pdf)

Abstract: Experiments were conducted to investigate the adsorption characteristics of dyes by anaerobic sludge in this study. Influence of dye type, sorption time, initial dye concentration, sludge concentration and temperature on dye biosorption was evaluated. Furthermore, the isotherms, kinetics and thermodynamic of biosorption were also explored. Experimental results show that anaerobic sludge had a much higher equilibrium adsorption density on Rhodamine B than on Eosin Y. The adsorption density of Rhodamine B onto sludge decreased with enhancing sludge concentration. At a lower Rhodamine B concentration, adsorption could reach saturation in a lower sludge concentration. Results also indicate that both Langmuir and Freundlich adsorption models were able to adequately describe the biosorption equilibrium of Rhodamine B onto anaerobic sludge. The biosorption followed the pseudo second-order adsorption kinetics.

Keywords: Anaerobic Sludge, Biosorption, Dye, Eosin Y, Freundlich Model, Kinetics, Langmuir Model, Rhodamine B, Thermodynamics

? Chen, C.Y., Chiang, C.L. and Huang, P.C. (2006), Adsorptions of heavy metal ions by a magnetic chelating resin containing hydroxy and iminodiacetate groups. *Separation and Purification Technology*, **50** (1), 15-21.

Full Text: [2006\Sep Pur Tec50, 15.pdf](2006/Sep%20Pur%20Tec50,%2015.pdf)

Abstract: A magnetic Fe3O4–glycidyl methacrylate–iminodiacetic acid–styrene–divinyl benzene resin (MPGI) was synthesized by the polymerization of glycidyl methacrylate–iminodiacetic acid (GMA–IDA), divinyl benzene and styrene in the presence of magnetic Fe3O4 for the removal of Cu(II), Cd(II) and Pb(II) from aqueous solutions. The weight fractions of Fe3O4 and GMA–IDA within MPGI were analyzed by potentiometric titration of carboxylic acids and thermogravimetric analyzer. The equilibrium adsorption capacities of MPGI from their single-metal ion solutions were 0.88 mmol/g for Cu(II), 0.81 mmol/g for Pb(II) and 0.78 mmol/g for Cd(II). Increasing the concentration (0–0.3 M) of KCl, NaCl, MgCl2 and CaCl2 in Cu(II) or Pb(II) solution affected the adsorption behavior slightly. As the salt concentrations in Cd(II) solution increased, the adsorption capacities of Cd(II) decreased in the order: Mg2+ > Ca2+ > Na+ > K+. Within the pH range of 2–5, decreasing the pH of the Cu(II) solution did not produce remarkable changes in the equilibrium adsorption capacities. However, significant decrements occurred for the adsorptions of Pb(II) or Cd(II) when the pH values of the solutions were less than 3. The competitive adsorption tests verified that this resin had good adsorption selectivity for Cu(II) with the coexistence of Pb(II) and Cd(II).

Keywords: Resin, Adsorption, Competitive Adsorption, Selectivity, Iminodiacetic Acid

? Kurtoğlu, A.E. and Atun, G. (2006), Determination of kinetics and equilibrium of Pb/Na exchange on clinoptilolite. *Separation and Purification Technology*, **50** (1), 62-70.

Full Text: [2006\Sep Pur Tec50, 62.pdf](2006/Sep%20Pur%20Tec50,%2062.pdf)

Abstract: Ion exchange kinetics and equilibria of lead on Na-pretreated clynoptilolite have been studied using batch method by means of electrometric and polarographic techniques. Equivalent fraction of lead ions exchanged with sodium has been determined by measuring time dependent Na+ ion concentration with sodium ion selective electrode (SISE). Electrode readings could be taken for a time interval of 15 s at early time of exchange. Time dependence of pH during exchange process has been followed simultaneously. Time dependent exchange curves showed a sharp increase at the beginning followed by a slower one for longer times until reaching equilibrium. The McKay equation for isotopic exchange kinetics has been applied to describe experimental results both in terms of out- and in-going ions. The film and particle diffusion coefficients evaluated from the McKay constants are not significantly affected by initial solution concentrations studied in the range of 1×10-4 to 1×10-4 M. Kinetic curves have been successfully modeled using the diffusion coefficients. An increase in the pH values at low concentrations below 10-3 M Pb can be attributed to contribution of H+/Na+ exchange whereas the decrease of pH is indicative of the uptake of hydroxyl ions to form lead hydroxide clusters into clinoptilolite at higher concentrations. Total amount of Pb adsorbed and exchanged at equilibrium condition has been determined from polarographic measurements and compared with those found for exchanged Pb. Equilibrium data have been analyzed and modeled in terms of Freundlich and Langnmir adsorption isotherms. Thermodynamic parameters for transition state have been evaluated from temperature dependent kinetic results. (C) 2005 Elsevier B.V. All rights reserved.

Keywords: Ion Exchange Kinetics, Lead, Clinoptilolite, Ion Selective Electrodes, Polarographic Measurement, Ion-Exchange, Natural Clinoptilolite, Isotopic-Exchange, Aqueous-Solutions, Modified Zeolites, Calcium-Ion, Removal, Pb2+, Lead, Isotherms

? Fiol, N., Villaescusa, I., Martínez, M., Miralles, N., Poch, J. and Serarols, J. (2006), Sorption of Pb(II), Ni(II), Cu(II) and Cd(II) from aqueous solution by olive stone waste. *Separation and Purification Technology*, **50** (1), 132-140.

Full Text: [2006\Sep Pur Tec50, 132.pdf](2006/Sep%20Pur%20Tec50,%20132.pdf)

Abstract: Olive stone waste generated in the olive oil production process has been investigated as metal biosorbent for Pb(II), Ni(II), Cu(II) and Cd(II) from aqueous solutions for its wide availability as agricultural waste and also for its cellulosic matrix rich of potential metal binding active sites. The effect of contact time, solution pH, ionic medium and initial metal concentration were studied in batch experiments at room temperature. Maximum metal sorption was found to occur at initial pH around 5.5–6.0. Kinetic studies revealed that the initial uptake was rapid and equilibrium was established in 1 h for all the studied metals and that the data followed the pseudo-second order reaction. The equilibrium sorption data for single metal systems at initial pH 5.5 were described by the Langmuir and Freundlich isotherm models, however, the non-competitive Freundlich model has been found to provide the best correlation. The highest value of Langmuir maximum uptake, (qmax), was found for cadmium (6.88×10−5 mol g−1) followed by lead (4.47×10−5 mol g−1), nickel (3.63×10−5 mol g−1) and copper (3.19×10−5 mol g−1). Similar Freundlich empirical constants, k, were obtained for all metals (2.4×10−5 to 2.8×10−5). Adsorption-complexation, in addition to ion-exchange, must be involved in the sorption process of copper, lead and cadmium while ion-exchange is the most important mechanism for Ni sorption. An increase of ionic strength concentration caused a decrease in metal removal. Sorption experiments with equimolar concentration of each metal in binary mixtures were also performed and then the extended Langmuir isotherm model fits adequately the experimental data. Desorption experiments put into evidence that after three contacts neither HCl nor EDTA solutions were able to desorb metals from the olive stones completely. The results obtained show that olive stone waste, which has a very low economical value, may be used for the treatment of wastewaters contaminated with heavy metals.

Keywords: Metal Removal, Low Cost Sorbent, Biosorption, Sorption Isotherms, Binary Mixtures

? Bayramoğlu, G., Senel, A.U. and Arica, M.Y. (2006), Effect of spacer-arm and Cu(II) ions on performance of l-histidine immobilized on poly(GMA/MMA) beads as an affinity ligand for separation and purification of IgG. *Separation and Purification Technology*, **50** (2), 229-239.

Full Text: [2006\Sep Pur Tec50, 229.pdf](2006/Sep%20Pur%20Tec50,%20229.pdf)

Abstract: In this study, the beads were prepared from glycidiyl methacrylate (GMA) and methyl methacrylate (MMA) via suspension polymerization and, the used beads fractions were between 75 and 150 μm. The epoxy groups of the beads were converted into amino groups by the reaction of ammonia or 1,6-diaminohexane as a spacer-arm. l-Histidine ligand was immobilized onto both beads. Cu(II) ions were chelated onto spacer-arm attached and l-histidine immobilized beads. The IgG adsorption capacity of the spacer-arm attached and Cu(II) chelated affinity beads led to higher adsorption capacities about 1.64- and 2.94-fold, respectively. The adsorption equilibrium studies showed that the adsorption isotherm of IgG obeyed the Langmuir isotherm model. The experimental data was well described by the second-order equations. Purification data of IgG with spacer-arm attached and Cu(II) ions chelated (i.e. poly(GMA/MMA)-SAH-Cu(II)) beads indicated that 87.5% of IgG was removed from human serum with a purity of 90%.

Keywords: Affinity Beads, Histidine, IgG, Adsorption, Purification, Thermodynamic Parameters

? Adak, A. and Pal, A. (2006), Removal of phenol from aquatic environment by SDS-modified alumina: Batch and fixed bed studies. *Separation and Purification Technology*, **50** (2), 256-262.

Full Text: [2006\Sep Pur Tec50, 262.pdf](2006/Sep%20Pur%20Tec50,%20262.pdf)

Abstract: Alumina is a very efficient adsorbent for the removal of anionic surfactant (AS) from aqueous environment even when it is present at a very high concentration. After removal of AS the exhausted surfactant coated alumina hereafter designated as surfactant-modified alumina (SMA) posses the ability to remove organic solutes from aquatic environment through the process called adsolubilization. In this study, SMA was used for the removal of phenol from water environment. In batch study it was seen that the pH < 7 favours the removal. The removal efficiency was increased in the presence of anions and decreased a little in the presence of cations. Temperature had no effect on the removal of phenol. The column having a diameter of 2 cm, with different bed heights such as 10, 20 and 30 cm could treat 1.65, 3.66 and 5.27 l of phenol bearing wastewater with initial phenol concentration 50 mg/l and flow rate 8.5 ml/min. Time required for the bed to become exhausted after the breakthrough occurred was very short. This indicated that the adsorption zone was almost saturated at the time of exhaustion. Different column design parameters like depth of exchange zone, time required for exchange zone to move its own height, adsorption rate, adsorption capacity, etc., were calculated. Theoretical breakthrough curve was drawn from the batch isotherm data and it was compared with experimental breakthrough curve. Desorption of phenol from the SMA surface was possible using 0.25M sodium hydroxide solution, rectified spirit and acetone.

Keywords: Alumina, Sodium Dodecyl Sulfate, Surfactant-Modified Alumina, Phenol, Adsorption, Column Study, Breakthrough Curve

? Ye, H.P., Chen, F.Z., Sheng, Y.Q., Sheng, G.Y. and Fu, J.M. (2006), Adsorption of phosphate from aqueous solution onto modified palygorskites. *Separation and Purification Technology*, **50** (3), 283-290.

Full Text: [2006\Sep Pur Tec50, 283.pdf](2006/Sep%20Pur%20Tec50,%20283.pdf)

Abstract: In this study, the natural and modified palygorskites were tested to remove phosphate ions from aqueous solution. The modified palygorskites were prepared by being activated with hydrochloric acid and/or thermal treatments. The surface structure of the materials was investigated by means of X-ray diffraction (XRD), a N2 adsorption–desorption technique and Fourier transform-infrared (FT-IR) to understand the effect of surface properties on the adsorption behavior of phosphate. In the adsorption test, the adsorption isotherms, kinetics, pH effect, desorbability and selectivity were examined. The results showed that the modified palygorskites had faster kinetics and higher adsorption capacities than the natural palygorskite, which can be attributed to the surface structural changes of the materials, and the adsorbed amounts of phosphate tend to decrease with the increase of pH for all samples. The desorbability of P is about 10–13%, and it is relatively difficult for the adsorbed PO43− to be desorbed. Palygorskite could selectively adsorbed phosphate in complex solutions, and the selectivity of phosphate adsorption onto palygorskites was 1000–3000 times that of chloride. The relatively low cost and high capabilities of the natural and modified palygorskites make them potentially attractive adsorbents for the removal of phosphate from aqueous solution.

Keywords: Acid Activation, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption-Desorption, Behavior, Chloride, Complex, Cost, FT-IR, FTIR, Hydrochloric Acid, Isotherms, Kinetics, Materials, Modified, Natural, Palygorskite, pH, Phosphate, Phosphate Adsorption, Phosphorus, Properties, Removal, Selectivity, Structure, Surface, Surface Properties, Surface Structure, Waste-Water, X-Ray Diffraction, XRD

? Tripathy, S.S., Bersillon, J.L. and Gopal, K. (2006), Removal of fluoride from drinking water by adsorption onto alum-impregnated activated alumina. *Separation and Purification Technology*, **50** (3), 310-317.

Full Text: [2006\Sep Pur Tec50, 310.pdf](2006/Sep%20Pur%20Tec50,%20310.pdf)

Abstract: The ability of the alum-impregnated activated alumina (AIAA) for removal of fluoride from water through adsorption has been investigated in the present study. All the experiments are carried out by batch mode. The effect of various parameters viz. contact time, pH effect (pH 2–8), adsorbent dose (0.5–16 g/l), initial fluoride concentration (1–35 mg/l) has been investigated to determine the adsorption capacity of AIAA. The adsorbent dose and isotherm data are correlated to the Bradley equation. The efficacy of AIAA to remove fluoride from water is found to be 99% at pH 6.5, contact time for 3 h, dose of 8 g/l, when 20 mg/l of fluoride is present in 50 ml of water. Energy-dispersive analysis of X-ray shows that the uptake of fluoride at the AIAA/water interface is due to only surface precipitation. The desorption study reveals that this adsorbent can be regenerated following a simple base–acid rinsing procedure, however, again impregnation of the regenerated adsorbent (rinsed residue) is needed for further defluoridation process.

Keywords: Fluoride, Impregnation, Activated Alumina, Adsorption, EDAX, Desorption

? Verma, A., Chakraborty, S. and Basu, J.K. (2006), Adsorption study of hexavalent chromium using tamarind hull-based adsorbents. *Separation and Purification Technology*, **50** (3), 336-341.

Full Text: [2006\Sep Pur Tec50, 336.pdf](2006/Sep%20Pur%20Tec50,%20336.pdf)

Abstract: The adsorption characteristics of hexavalent chromium was studied with an adsorbent developed from waste tamarind hull. Experiments were conducted in batch mode to observe the influence of different parameters such as initial concentration of metal ions, adsorbent dosage, adsorbent particle size, stirrer speed, temperature and pH of the solution. Acidic pH strongly favored the adsorption. With decreasing the pH of the solution from 5.0 to 1.0, the removal of chromium was enhanced from 33% to 99%. The adsorption process was found to follow a pseudo-first-order rate mechanism and the rate constant was evaluated at 30 °C. The Freundlich, Redlich–Peterson and the Fritz–Schlunder isotherm fit the equilibrium data satisfactorily. Adsorption of chromium was found to increase with increase in the process temperature. Using an adsorbent dosage of 1.0 g/L and an acidic pH (2.0), the equilibrium adsorption capacity of the prepared adsorbent was found to be about 70 mg/g at 30 °C, which increased to about 81 mg/g at 50 °C. The entropy change, free energy change and heats of adsorption were determined for the process.

Keywords: Hexavalent Chromium, Tamarind Hull, Adsorption Isotherm, Thermodynamic Parameters, pH Effect, Rate Constant

? Kaušpėdienė, D. and Snukiškis, J. (2006), Sorption kinetics of ammonia and ammonium ions on gel and macroporous sulphonic acid cation exchangers. *Separation and Purification Technology*, **50** (3), 347-353.

Full Text: [2006\Sep Pur Tec50, 347.pdf](2006/Sep%20Pur%20Tec50,%20347.pdf)

Abstract: Diffusion of ammonia and ammonium ions in sulphonic acid cation exchangers (gel Purolite SGC 100×10 MBH and macroporous Purolite C 160 MBH) from the solutions, representing the composition of ‘caustic condensate’ (waste of nitrogen fertilizers production) is affected by pH of initial solution and structure of the matrix of cation exchanger. In gel matrix the effective intraparticle diffusivity (*D*ef) depends greatly on the solution pH because of shrinkage in alkaline and swelling in acidic medium: on decreasing the initial concentration of ammonia from 0.214 to 0.003 and increasing that of ammonium nitrate from 0 to 0.214 mol l−1 instead, the effect of ion exchange leads to a decrease in pH, resulting in swelling and increase in *D*ef from 0.1 to 0.34×10−10 for gel Purolite SGC 100×10 MBH and variation of 0.18–0.11×10−10 m2 s−1 for macroporous Purolite C 160 MBH (resistant to shrinkage and swelling).

In Purolite C 160 MBH both macropore diffusivity (0.07–0.29×10−10 m2 s−1) and gel (solid phase) diffusivity (0.06–0.19×10−10 m2 s−1) are higher than micropore diffusivity (0.28–0.56×10−18 m2 s−1).

With respect to the effective intraparticle diffusivity, resistance to nitric acid, used for the regeneration, and high concentration of ammonium nitrate in eluate (up to 110 g l−1), Purolite C 160 MBH has been installed for the conversion of ammonia and ammonium ions to ammonium nitrate reusable in the fertilizers production. This allows minimizing the economic loss and preventing the environmental contamination.

Keywords: Cation Exchangers, Ammonium Recovery, Caustic Condensate, Fertilizers Production

? Han, Y.H., Quan, X., Chen, S., Zhao, H.M., Cui, C. and Zhao, Y.Z. (2006), Electrochemically enhanced adsorption of aniline on activated carbon fibers. *Separation and Purification Technology*, **50** (3), 365-372.

Full Text: [2006\Sep Pur Tec50, 365.pdf](2006/Sep%20Pur%20Tec50,%20365.pdf)

Abstract: For adsorptive separation processes, the adsorption rate and capacity are two important factors affecting the costs. This study describes the anodic polarization of activated carbon fibers (ACFs), which can enhance the adsorption rate and capacity of aniline. The electrosorption kinetics and the affecting factors (bias potential, electrolyte, and pH) of isotherms for aniline on ACFs were investigated. The adsorption/electrosorption of aniline on ACFs follow pseudo-first-order adsorption kinetics, and the adsorption rate improves with increasing bias potential. The electrosorption isotherms, which exhibit a variety of responses depending on bias potential, electrolyte and pH, follow the two classical models of Langmuir and Freundlich. With electrosorption of aniline from aqueous solution, a two-fold enhancement of adsorption capacity is achievable. The initial and saturated ACFs were characterized using scanning electron micrograph (SEM) and Fourier transform infrared spectroscopy (FT-IR). The SEM micrographs show that the surface of ACFs is not oxidized, which is also verified by cyclic voltammetry results. The FT-IR spectroscopy suggests that the interaction between aniline and ACFs is main weak physisorption instead of chemisorption. These experimental results suggest that the electrochemical polarization of ACFs can effectively improve the adsorption rate and capacity of aniline, which may be due to the enhanced affinity between aniline and ACFs instead of the oxidation on the surface of ACFs or in the solution.

Keywords: Activated Carbon Fibers, Aniline, Electrosorption, Adsorption Kinetics, Adsorption Isotherms

? Bhattacharyya, K.G. and Sen Gupta, S. (2006), Kaolinite, montmorillonite, and their modified derivatives as adsorbents for removal of Cu(II) from aqueous solution. *Separation and Purification Technology*, **50** (3), 388-397.

Full Text: [2006\Sep Pur Tec50, 388.pdf](2006/Sep%20Pur%20Tec50,%20388.pdf)

Abstract: Adsorption of metals by clay minerals is a complex process controlled by a number of environmental variables. The present work investigates the removal of Cu(II) ions from an aqueous solution by kaolinite, montmorillonite, and their poly(oxo zirconium) and tetrabutylammonium derivatives. The entry of ZrO and TBA into the layers of both kaolinite and montmorillonite was confirmed by XRD measurement. The specific surface areas of kaolinite, ZrO-kaolinite, TBA-kaolinite, montmorillonite, ZrO-montmorillonite, TBA-montmorillonite were 3.8, 13.4, 14.0, 19.8, 35.8 and 42.2 m2/g, respectively. The cation exchange capacity (CEC) was measured as 11.3, 10.2, 3.9, 153.0, 73.2 and 47.6 meq/100 g for kaolinite, ZrO-kaolinite, TBA-kaolinite, montmorillonite, ZrO-montmorillonite, TBA-montmorillonite, respectively. Adsorption increased with pH till Cu(II) ions became insoluble in alkaline medium. The kinetics of the interactions suggests that the interactions could be best represented by a mechanism based on second order kinetics (k2 = 7.7×10−2 to 15.4×10−2 g mg−1 min−1). The adsorption followed Langmuir isotherm model with monolayer adsorption capacity of 3.0–28.8 mg g−1. The process was endothermic with ΔH in the range 29.2–50.7 kJ mol−1 accompanied by increase in entropy and decrease in Gibbs energy. The results have shown that kaolinite, montmorillonite and their poly(oxo zirconium) and tetrabutyl-ammonium derivatives could be used as adsorbents for separation of Cu(II) from aqueous solution.

Keywords: Adsorption, Adsorption Isotherm, Copper, Cu(II), Gas-Adsorption, Heavy-Metal Removal, Ions, Isotherm, Kaolinite, Kinetics, Kinetics, Langmuir Isotherm Model, Model, Montmorillonite, Pillared Clays, Poly(Oxo Zirconium) Clay, Removal, Second-Order, Silica, Sorption, Tetrabutyl-Ammonium Clay, Tree Fern, Water

? Kundu, S. and Gupta, A.K. (2006), Adsorptive removal of As(III) from aqueous solution using iron oxide coated cement (IOCC): Evaluation of kinetic, equilibrium and thermodynamic models. *Separation and Purification Technology*, **51** (2), 165-172.

Full Text: [2006\Sep Pur Tec51, 165.pdf](2006/Sep%20Pur%20Tec51,%20165.pdf)

Abstract: The ability of iron oxide coated cement (IOCC) to remove As(III) by sorption from solution was assessed. Batch experiments were conducted to characterize the As(III) removal capacity of IOCC. The effects of process parameters such as pH (3.2–12), agitation speed (50–250 rpm), contact time, initial As(III) concentration (0.7–13.5 mg l−1) and background ions (Ca2+, Mg2+, Fe3+, SO42−, PO43−, Cl− and NO3−) on As(III) uptake were investigated. The adsorption kinetics study at 303 K revealed that the uptake of As(III) ion was very rapid and most of fixation occurred within the first 20 min of contact and pseudo-second order rate equation was able to provide realistic description of adsorption kinetics. Linear regression analysis showed that the equilibrium data of As(III) adsorption at different initial As(III) concentrations and adsorbent dose of 30 g l−1, obeyed the Langmuir isotherm model with maximum sorption capacities of 0.73, 0.69, 0.67 and 0.66 mg g−1 of As(III) on IOCC at 288, 298, 308 and 318 K, respectively. Non-linear error analysis showed that Freundlich isotherm best-fits the equilibrium data for As(III) adsorption onto IOCC. Evaluation of the thermodynamic parameters ΔH°, ΔS° and ΔG° indicated a spontaneous and exothermic nature of adsorption. The presence of co-existing ions such as Ca2+, Mg2+, Fe3+, SO42−, PO43−, Cl− and NO3− had no noticeable effect on As(III) removal showing excellent As(III) sequestering capability of IOCC. The adsorbent was also suitable for repeated use (for three cycles) without noticeable loss of capacity.

Keywords: Adsorption, Arsenic, Kinetics, Isotherm, Equilibrium

? Erdem, M. and Ozverdi, A. (2006), Kinetics and thermodynamics of Cd(II) adsorption onto pyrite and synthetic iron sulphide. *Separation and Purification Technology*, **51** (3), 240-246.

Full Text: [2006\Sep Pur Tec51, 240.pdf](2006/Sep%20Pur%20Tec51,%20240.pdf)

Abstract: In this paper, the Cd(II) adsorption abilities of pyrite and synthetic iron sulphide (SIS) were studied. Experiments were carried out as a function of pH, Cd(II) concentration, contact time and temperature. Maximum adsorption yields for pyrite and SIS were determined to be 34.2% and 65.8% under the conditions of initial Cd(II) concentration of 100 mg/l, pH 5.4, contact time of 120 min and adsorbent dosage of 20 g/l, respectively. The adsorption data fitted both the Langmuir and Freundlich adsorption models. Adsorption capacities of SIS and pyrite at 25 °C were found to be 3.05 and 2.08 mg Cd(II)/g, respectively. The first-order and pseudo second-order rate expressions were applied to experimental data and it was determined that the adsorption process followed the first-order kinetic model. In addition, activation energy values and some thermodynamic parameters such as ΔG°, ΔH° and ΔS° for the cadmium adsorption processes were calculated from the isotherm and kinetic data. The adsorption of Cd(II) on to SIS and pyrite was found to be endothermic and spontaneous.

Keywords: Cadmium, Adsorption, Kinetics, Isotherms, Pyrite, Iron Sulphide

? Wang, S.G., Gong, W.X., Liu, X.W., Gao, B.Y. and Yue, Q.Y. (2006), Removal of fulvic acids using the surfactant modified zeolite in a fixed-bed reactor. *Separation and Purification Technology*, **51** (3), 367-373.

Full Text: [2006\Sep Pur Tec51, 367.pdf](2006/Sep%20Pur%20Tec51,%20367.pdf)

Abstract: Modification of zeolite (clinoptilolite) surface with a quaternary ammonium, hexadecyl trimethyl ammonium (HDTMA), to improve the removal efficiency of fulvic acids (FA) in a zeolite fixed bed was investigated. The experiment consisted of modifying zeolite with HDTMA followed by adsorption and desorption of FA in the column. The effects of relevant parameters, such as HDTMA loading levels, FA flow rate and eluant concentration were examined, respectively. Optimization studies show that the surfactant modified zeolite (SMZ) bed with HDTMA loading of 120% of ECEC at a flow rate of 5 BV/h had the best performance and the volume of 23 BV of 30 vol% ethanol solution with the feed flow rate of 5 BV/h was sufficient for complete regeneration of SMZ and desorption of FA. Measurements of Zeta potential of SMZ indicate that a monolayer formation is the most viable packing that enables maximum removal of FA. FA adsorption on SMZ surfaces is largely due to the hydrophobic interaction and hydrogen bonding while FA desorption depends on hydrogen bonding. Partition and mass transfer also play an important role in the adsorption and desorption of FA. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Surfactant Modified Zeolite (SMZ), Fulvic Acids, Adsorption, Desorption, Mechanism, Natural Organic-Matter, Atomic-Force Microscopy, Humic Substances, Iron-Oxide, Adsorption, Sorption, Water, Clinoptilolite, Contaminants, Soil

? Golder, A.K., Samanta, A.N. and Ray, S. (2006), Removal of phosphate from aqueous solutions using calcined metal hydroxides sludge waste generated from electrocoagulation. *Separation and Purification Technology*, **52** (1), 102-109.

Full Text: [2006\Sep Pur Tec52, 102.pdf](2006/Sep%20Pur%20Tec52,%20102.pdf)

Abstract: Removal of heavy metals by electrocoagulation generates substantial amount of electrocoagulated metal hydroxides sludge (EMHS). This paper reports calcined EMHS as an effective adsorbent for removal of PO43− from aqueous solutions. Cumulative % removal of PO43− is investigated in a batch adsorber with different initial adsorbate concentrations, adsorbent dose, pH of the solution and adsorption temperature. Adsorption of PO43− is due to ligand exchange between the OH group on oxide surface and PO43− in the aqueous medium with formation of inner surface complex. Removal of PO43− is found to be high at lower pH values and higher temperatures indicating strong positively charged metal oxide surface at acidic pH (<pHzpc) and the endothermic nature of adsorption. The experimental results preferably fitting the Langmuir isotherm suggest monolayer coverage of adsorbed molecules. Pseudo-second-order kinetic model provides the best fitting to experimental results at different adsorbent dose and adsorption temperature. The magnitude of the activation energy (10.33 kJ/mol) is calculated based on pseudo-second-order rate constants from Arrhenius equation indicates removal of PO43− corresponds to activated chemisorption.

Keywords: Adsorption, Endothermic, Langmuir Isotherm, Monolayer Coverage, Activation Energy, Chemisorption

? Yavuz, H., Denizli, A., Güngüneş, H., Safarikova, M. and Safarik, I. (2007), Biosorption of mercury on magnetically modified yeast cells. *Separation and Purification Technology*, **52** (2), 253-260.

Full Text: [2006\Sep Pur Tec52, 253.pdf](2006/Sep%20Pur%20Tec52,%20253.pdf)

Abstract: Brewer’s yeast (bottom yeast, *Saccharomyces cerevisiae* subsp. uvarum) cells were magnetically modified using water based magnetic fluid stabilized perchloric acid. The magnetically modified yeast cells were characterized by scanning electron microscopy (SEM) and electron spin resonance (ESR). Hg2+ biosorption-desorption properties of magnetically modified yeast cells from synthetic solutions were utilized in batch system. The biosorption process was fast, 80% of biosorption occured within 60 min and equilibrium was achieved at around 90 min. The maximum Hg2+ biosorption capacity was obtained to be 114.6 mg/g at 35 °C. The suitability of the Langmuir, Freundlich and Redlich-Peterson adsorption models to the equilibrium data was investigated for mercury-biosorbent system. The results were well fitted to the Langmuir isotherm. The applicability of two kinetic models including pseudo-first order and pseudo-second order model was estimated on the basis of comparative analysis of the corresponding rate parameters, equilibrium capacity and correlation coefficients. Results suggest that chemisorption processes could be the rate-limiting step in the biosorption process. The yeast biomass can be easily regenerated by 0.1 M HNO3 with higher effectiveness. Biosorption of heavy metal ions from artificial wastewater was also studied. The biosorption capacities are 29.9 mg/g for Cu2+, 76.2 mg/g for Hg2+, 14.1 mg/g for Ni2+ and 11.8 mg/g for Zn2+.

Keywords: Mercury Removal, Magnetic Biosorbents, Yeast, Heavy Metal Removal

? Bastani, D., Safekordi, A.A., Alihosseini, A. and Taghikhani, V. (2006), Study of oil sorption by expanded perlite at 298.15 K. *Separation and Purification Technology*, **52** (2), 295-300.

Full Text: [2006\Sep Pur Tec52, 295.pdf](2006/Sep%20Pur%20Tec52,%20295.pdf)

Abstract: Sorption capacity as well as sorption kinetics of oil onto four different expanded perlites with different physical and surface properties were studied. In order to meticulously measure the amount of oil to be sorbed onto the adsorbents used in this study both static and dynamic methods were employed. It would be worth noting that the adsorbent, i.e., perlite can spread on the oil and float on the surface thanks to its low density. The variation of the amount of oil sorbed onto the adsorbents with time was recorded and the weight of adsorbent was monitored at each specified time. The experimental results showed that grain sizes with high surface area can sorb oil to be spread on water surface. It should be also stressed that the experiments conducted were replicated three times and the results reported are the average of replicas. The results obtained were correlated with the first order, second order sorption kinetics as well as the intra-particle diffusion models. The results showed that the second order kinetic model studied can more accurately correlate the experimental data generated than the first order sorption kinetic and the intra-particle diffusion models.

Keywords: Perlite, Oil Spill, Sorption Capacity, Sorption Kinetics

? Aloulou, F., Boufi, S. and Labidi, J. (2006), Modified cellulose fibres for adsorption of organic compound in aqueous solution. *Separation and Purification Technology*, **52** (2), 332-342.

Full Text: [2006\Sep Pur Tec52, 332.pdf](2006/Sep%20Pur%20Tec52,%20332.pdf)

Abstract: This paper presents the results of an experimental study of removal of organic contaminant from wastewater using chemically modified cellulose fibres. The adsorption capacities of the modified fibres towards various organic molecules were investigated. The ensuing modified fibres appeared to be efficient absorbent for different dissolved organic molecules in water. The recycling tests revealed that the exhausted substrates could be regenerated without loosing their capacity. The adsorption isotherm related to different solutes follows the Langmuir model in entire range of concentration. To confirm the possibility of using the modified cellulose fibres as a sorbent for the removal of dissolved organic pollutant, adsorption breakthrough curves were established under different operating condition such as concentration, flow rate and the column length. The main advantage of this substrate lies in its relative facile regeneration without a significant loss of its adsorption capacity.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Capacity, Cellulose, Cellulose Fibres, Concentration, Condition, Dissolved, Flow, Isotherm, Langmuir, Metals, Model, Modified, Organic, Organic Molecules, Organic Pollutant, Organic Solute, Paper, Pollutant, Range, Recycling, Regeneration, Removal, Sorption, Substrate, Wastewater, Water

? Yin, C.Y., Aroua, M.K. and Daud, W.M.A.W. (2007), Review of modifications of activated carbon for enhancing contaminant uptakes from aqueous solutions. *Separation and Purification Technology*, **52** (3), 403-415.

Full Text: [2007\Sep Pur Tec52, 403.pdf](2007/Sep%20Pur%20Tec52,%20403.pdf)

Abstract: Due to its versatility and wide range of applications, activated carbon is widely used as contaminant removal media. Recent research have focused on enhancing the effectiveness of activated carbon by modifying their specific properties in order to enable the carbon to develop affinity for certain contaminants. In view of this, a comprehensive list of literatures on chemical, physical and biological modification techniques of activated carbon pertaining to enhancement of contaminant removal from aqueous solutions was compiled and reviewed. Acidic treatment to introduce acidic functional groups onto surface of activated carbon was by far, the most studied technique. It was apparent from the literature survey that the beneficial effects of specific modification techniques on activated carbon adsorption of targeted contaminant species from aqueous solutions were profound, with some studies reported increase of contaminant uptake factors of more than 2. Concurrently, considerable decreases associated with certain contaminant uptakes can also occur depending on the technique used.

Keywords: Activated Carbon Modification, Surface Functional Groups, Impregnation, Contaminant, Aqueous Solution

? Shukla, A. and Kumar, A. (2007), Separation of Cr(VI) by zeolite–clay composite membranes modified by reaction with NOx. *Separation and Purification Technology*, **52** (3), 423-429.

Full Text: [2007\Sep Pur Tec52, 423.pdf](2007/Sep%20Pur%20Tec52,%20423.pdf)

Abstract: In this work, we report the use of modified zeolite–clay composite ultrafiltration membranes (preparation of the unmodified (Z1), the nitrated (Z2, modified using NOx) and the aminated (Z3) membrane have been described in our earlier publication [1]) for the separation of chromic acid solution. Experiments show that the observed rejection coefficients of the membranes increase on modification from ~20% for Z1 to ~40% for Z2 and ~50% for Z3 membrane. Experimental data is analyzed using the irreversible thermodynamic approach (Spiegler–Kedem equations) [2]. The study shows that the chemical modification of membranes leads to a rise in the intrinsic rejection (highest *R* ~50% for Z1 to ~60% for Z2 and ~66% for Z3 membrane) coefficients. It is also found that while the observed rejection show anomalous trend with variation in pressure while the intrinsic rejection increases with increase in pressure, a trend typical of the separation of electrolyte through charged membranes.

Keywords: Chromic Acid, Charged Ultrafiltration, Zeolite Membranes

? Ayoob, S., Gupta, A.K. and Bhakat, P.B. (2007), Analysis of breakthrough developments and modeling of fixed bed adsorption system for As(V) removal from water by modified calcined bauxite (MCB). *Separation and Purification Technology*, **52** (3), 430-438.

Full Text: [2007\Sep Pur Tec52, 430.pdf](2007/Sep%20Pur%20Tec52,%20430.pdf)

Abstract: The feasibility of As(V) removal from aqueous environment by a fixed bed of the adsorbent, modified calcined bauxite (MCB), in a continuous flow system has been investigated. The response of the adsorbent bed under various operating conditions of bed depth, flow rate and influent concentration were examined. The various column parameters including adsorption rate, adsorption capacity and depth of exchange zone were evaluated using the Bohart and Adams adsorption model. MCB exhibited an adsorption capacity of 627.3 mg/l with an adsorption rate constant 0.9925 l/mg h at an influent As(V) concentration of 2 mg/l. A minimum adsorbent depth of 1.3 cm is enough to produce effluent with As(V) concentration less than 0.01 mg/l from an influent of 2 mg/l, in a 20 mm diameter MCB column. The service time of adsorbent beds under different flow rate and influent concentration were predicted using the bed depth service time (BDST) model and are compared with experimental observations. The observed data on service time and breakthrough curve correlated well with the theoretical values. The breakthrough curves of MCB obtained by experimental observations under different flow rates were compared with those developed by mass transfer model using Langmuir isotherm data. In the continuous flow system, MCB is found to have As(V) scavenging potential of 0.470 mg of As(V)/g.

Keywords: As(V), Adsorption, Bdst, Breakthrough Curve, Modified Calcined Bauxite

? Ünlü, N. and Ersoz, M. (2007), Removal of heavy metal ions by using dithiocarbamated-sporopollenin. *Separation and Purification Technology*, **52** (3), 461-469.

Full Text: [2007\Sep Pur Tec52, 461.pdf](2007/Sep%20Pur%20Tec52,%20461.pdf)

Abstract: In this study, the sorption conditions of Cu(II), Pb(II) and Cd(II) metal ions onto dithiocarbamated-spororpollenin (DTC-S) have been investigated. The different variables affecting the sorption capacity such as pH of the solution, sorption time, initial metal ion concentration and temperature have been investigated. Experimental data were exploited for kinetic and thermodynamic evaluations related to the sorption processes. Sorption isotherms correlated well with the Langmuir type sorption isotherm and sorption capacities were found to be 0.2734, 0.4572 and 0.0631 mmol g−1 for Cu(II), Pb(II) and Cd(II) metal ions, respectively. Sorption processes for three target heavy metal ions were found to follow pseudo-second order type sorption kinetics. Intraparticle diffusion was found to take part in sorption processes but it could not be accepted as the primary rate determining step. On the evaluation of the results obtained for the mean free energies of sorption (*E*) and enthalpy of sorption (Δ*H*°) it was observed that the resin mainly shows the characteristics of a chelating exchanger. Thermodynamic parameters, Δ*H*°, Δ*S*° and Δ*G*° were also calculated from graphical interpretation of the experimental data. Standard heats of sorption (Δ*H*°) were found to be endothermic and Δ*S*° values were calculated to be positive for the sorption of Cu(II), Pb(II) and Cd(II) ions onto the adsorbent. Negative Δ*G*° values indicated that sorption process for these three metal ions onto DTC-Sp is spontaneous.

Keywords: Heavy Metals, Dithiocarbamate, Sporopollenin, Langmuir Isotherm, Freundlich Isotherm, D–R Isotherm, Kinetics, Thermodynamics

? Deliyanni, E.A., Peleka, E.N. and Lazaridis, N.K. (2007), Comparative study of phosphates removal from aqueous solutions by nanocrystalline akaganéite and hybrid surfactant-akaganéite. *Separation and Purification Technology*, **52** (3), 478-486.

Full Text: [2007\Sep Pur Tec52, 478.pdf](2007/Sep%20Pur%20Tec52,%20478.pdf)

Abstract: In this study, phosphates removal from aqueous solutions was investigated using synthetic prepared nanocrystalline oxyhydroxide material in unmodified and surfactant modified form. Equilibrium and kinetic studies were carried out to determine the sorption capacity of akaganéite and the rate of phosphate ions uptake. Equilibrium data were analyzed by Langmuir and Freundlich isotherms. The sorption capacity was found to be 59.62 mg P g−1 for pure nanocrystalline akaganéite and 451.20 mg P g−1 for hybrid surfactant-akaganéite. Kinetic data followed a pseudo-second-order kinetic model. FT-IR spectra indicate the presence of inner-sphere complexes. Desorption studies showed entirely different behaviour between the two materials.

Keywords: Adsorption, Phosphate, Akaganéite, Hybrid Surfactant-Akaganéite, Isotherms

? Anirudhan, T.S., Senan, P. and Unnithan, M.R. (2007), Sorptive potential of a cationic exchange resin of carboxyl banana stem for mercury(II) from aqueous solutions. *Separation and Purification Technology*, **52** (3), 512-519.

Full Text: [2007\Sep Pur Tec52, 512.pdf](2007/Sep%20Pur%20Tec52,%20512.pdf)

Abstract: A cationic exchange resin of carboxyl banana stem (CBS) was fabricated through the hydrolysis of graft copolymer of banana stem (BS) with acrylonitrile that was made using ceric ammonium nitrate (CAN) initiator. Infrared spectroscopy and acid–base titration were used to confirm graft copolymer formation and carboxylate functionalization. SEM studies of CBS clearly indicated that adsorbent has rough and porous surface caused by rigid and hydrophobic nature of acrylonitrile cross-links. Thermal stability of the CBS was studied using thermogravimetry. The cationic exchange capacity (CEC) of the CBS was determined to be 1.68 mequiv. g−1. The sorptive potential of the CBS for mercury(II) from aqueous solutions was examined by the batch technique. The optimum pH range for the maximum removal of mercury(II) was 6.0–9.0. The CBS was observed to have high adsorptive capacity for mercury(II) with 99.3% from a solution containing 10 mg L−1 of mercury(II) with 0.2% (w/v) concentration of CBS. The experimental kinetic data for the mercury(II)–CBS system were analyzed using the linearised form of the Elovich model, a second-order kinetic equation. The isotherm data were correlated reasonably with the Langmuir isotherm and the mercury(II) adsorption capacity was found to be 90.88 mg g−1 at 30 °C. The quantitative removal of 10 mg L−1 mercury(II) in 50 mL chlor-alkali industry wastewater by 125 mg of CBS was observed at pH 6.0. The mercury(II)-loaded CBS can be regenerated by 0.1 M HCl treatment without altering the adsorbent properties.

Keywords: Graft Copolymerisation, Banana Stem, Mercury(II) Removal, Adsorption Isotherm, Regeneration

? Crini, G., Peindy, H.N., Gimbert, F. and Robert, C. (2007), Removal of C.I. Basic Green 4 (Malachite Green) from aqueous solutions by adsorption using cyclodextrin-based adsorbent: Kinetic and equilibrium studies. *Separation and Purification Technology*, **53** (1), 97-110.

Full Text: [2007\Sep Pur Tec53, 97.pdf](2007/Sep%20Pur%20Tec53,%2097.pdf)

Abstract: Batch sorption experiments were carried out for the removal of C.I. Basic Green 4 (Malachite Green), a cationic dye from its aqueous solution using cyclodextrin-based material (CD/CMC material) as adsorbent. The operating variables studied were adsorbent mass, particle size, agitation speed, solution pH, contact time and initial dye concentration. Adsorption experiments indicated that the adsorption capacity was dependent of operating variables and the process was strongly pH-dependent. Kinetic measurements showed that the process was uniform and rapid. Sorption of dye reached equilibrium in 120 min. In order to investigate the mechanism of sorption, adsorption data were modeled using the pseudo-first-order and pseudo-second-order kinetic equations, and intraparticle diffusion model. On the basis of the non-linear chi-square test, it was found that the adsorption kinetics followed a pseudo-second-order model for the dye concentration range studied in the present work, suggesting that the rate-limiting step may be chemisorption. Equilibrium isotherm was analyzed using the Langmuir and the Freundlich isotherms. The characteristic parameters for each model have been determined. The Langmuir model yields a much better fit than the Freundlich model. The maximum sorption capacity was 91.9 mg/g at 25 °C and the negative value of free energy change indicated the spontaneous nature of adsorption.

Keywords: C.I. Basic Green 4, Cyclodextrin, Adsorbent, Adsorption, Batch Mode, Kinetic Modeling, Isotherms

? Hashim, M.A. and Chu, K.H. (2007), Prediction of protein breakthrough behavior using simplified analytical solutions. *Separation and Purification Technology*, **53** (2), 189-197.

Full Text: [2007\Sep Pur Tec53, 189.pdf](2007/Sep%20Pur%20Tec53,%20189.pdf)

Abstract: The predictability of the breakthrough behavior of lysozyme on the strong cation exchanger SP Sepharose FF was evaluated using two different but related analytical solutions. The first solution, known as the Thomas equation, assumes that adsorption can be represented by a pseudo second-order reaction rate law which translates into a Langmuir isotherm at equilibrium. The second solution, known as the Bohart–Adams equation, assumes that adsorption can be described by a quasi-chemical rate law which reduces to a rectangular isotherm at equilibrium. The Bohart–Adams solution can be regarded as a limiting form of the Thomas solution. The equilibrium and rate parameters embedded in the two solutions were extracted from batch experiments. Predictions using the two simplified solutions agreed with experimental breakthrough data. When the isotherm is highly favorable the simpler Bohart–Adams solution can be used as a practically useful modeling tool in lieu of the mathematically complicated Thomas solution.

Keywords: Adsorption, Adsorption-Kinetics, Affinity-Chromatography, Batch, Batch Experiments, Bed Adsorption, Behavior, Bohart-Adams, Breakthrough, Breakthrough Curve, Cation, Cation Exchanger, Data, Design, Equilibrium, Experimental, Experiments, First, Fixed Bed, Ion-Exchange Chromatography, Isotherm, Langmuir, Langmuir Isotherm, Law, Ligand, Lysozyme, Media, Membrane Chromatographic Columns, Modeling, Performance, Protein, Pseudo, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Purification, Rate Law, Rights, Second Order, Second-Order, Solution, Solutions, Thomas, Tool

? Janoš, P., Sypecká, J., Mlčkovská, P., Kuráň, P. and Pilařová, V. (2007), Removal of metal ions from aqueous solutions by sorption onto untreated low-rank coal (oxihumolite). *Separation and Purification Technology*, **53** (3), 322-329.

Full Text: [2007\Sep Pur Tec53, 322.pdf](2007/Sep%20Pur%20Tec53,%20322.pdf)

Abstract: Naturally occurring kind of weathered and oxidized young brown coal called oxihumolite was used for an adsorptive removal of heavy metal cations (Cd2+, Cu2+, Co2+, Ni2+, Pb2+, Zn2+) from waters. A working range for the oxihumolite as a sorbent is in a slightly acidic medium (pH ca. 3.5–4.5), where it exhibits a sufficient stability and sorption capability. Typical sorption capacities estimated from equilibrium measurements (sorption isotherms) ranged from ca. 0.1 to 0.4 mmol g−1. The kinetic dependencies for the metal sorption were measured in a batch arrangement and evaluated using both pseudo-first- and pseudo-second-order kinetic models. The metal sorption was a quite rapid process that may be characterized by half-times ranging from ca. 10 to 80 min. The intraparticle diffusion was identified as the main mechanism controlling the rate of the sorption. Various extraction tests, namely the standardized leaching test with water and the three-step sequential BCR test, were used to examine a leachability of the heavy metals from the loaded sorbents and to assess potential risks of their subsequent liberation into the environment. Certain differences in the sorption and extraction behaviours of the examined metal ions (e.g. a high sorption capacity and low leachability of Pb2+) can be related to the well-known ‘selectivity sequences’ (or stabilities of the metal–humate complexes) as published in literature.

Keywords: Binding, Capacity, Coal, Complexes, Cu2+, Diffusion, Dyes, Environment, Equilibrium, Extraction, Extraction Tests, Heavy Metal, Heavy Metals, Heavy-Metals, Humic Acids, Isotherms, Kinetic, Kinetic Models, Kinetics, Leaching, Measurements, Mechanism, Metal, Metal Ions, Metal Sorption, Metals, Model, Models, Multicomponent Adsorption, Natural Organic-Matter, Peat, pH, Pseudo-Second-Order, Range, Removal, Risks, Sorption, Sorption Capacity, Sorption Isotherms, Stability, Test, Waste-Water, Water, Waters, Young Brown Coal, Zn2+

? Weng, C.H., Tsai, C.Z., Chu, S.H. and Sharma, Y.C. (2007), Adsorption characteristics of copper(II) onto spent activated clay. *Separation and Purification Technology*, **54** (2), 187-197.

Full Text: [2007\Sep Pur Tec54, 187.pdf](2007/Sep%20Pur%20Tec54,%20187.pdf)

Abstract: This study was to investigate the adsorption characteristics of Cu(II) onto spent activated clay (SAC) or so-called spent bleaching earth, a waste produced from an edible oil refinery company. Results of kinetic experiments showed that the Cu(II) adsorption rate was fast and more than 90% of Cu adsorption occurred within 5 min. Among the kinetic models tested, the adsorption kinetics was best described by the pseudo-second-order equation. The rate of adsorption decreased with increasing surface loadings. Results of equilibrium experiments showed that the solution pH was the key parameter affecting the adsorption characteristics. The adsorption of Cu(II) ions onto SAC occurs up to the precipitation pH, and then the precipitation of Cu ions starts. The Langmuir adsorption isotherm properly describes the equilibrium adsorption and the maximum adsorption capacities of SAC towards Cu(II) were determined to be 10.9, 11.5, and 13.2 mg/g, respectively at pH 5.0, 5.5, and 6.0. As temperature was increased from 4 to 50°C, the adsorption capacity increased from 9.5 to 12.8 mg/g for solution pH of 5.0. Values of ΔG° ranging from -5.73 to -7.26 kcal/mol suggest that the adsorption process is spontaneous and mainly governed by specific surface interaction mechanism. The values of ΔH° and ΔS° were 3.47 kcal/mol and 33.2 cal/(mol K), respectively. Results of this study will be useful for future scale up for using this material as a low-cost adsorbent for the removal of Cu(II) from wastewater. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activated Clay, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Copper, Adsorption Isotherm, Adsorption Kinetics, Adsorption Process, Adsorption Rate, Bleaching Earth, Capacity, Characteristics, Clay, Copper(II), Cu, Cu(II), Cu(II) Ions, Dilute Aqueous-Solution, Equilibrium, Experiments, Fly-Ash, Interaction, Ions, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Loadings, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Mechanism, Metal-Ions, Methylene-Blue, Models, pH, Physicochemical Environment, Precipitation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Rights, Scale, Sludge-Ash, Solution, Specific Surface, Spent Activated Clay, Spontaneous, Surface, Surface Interaction, Temperature, Thermodynamics, Waste, Waste-Water, Wastewater

? Rakotondramasy-Rabesiaka, L., Havet, J.L., Porte, C. and Fauduet, H. (2007), Solid–liquid extraction of protopine from *Fumaria officinalis* L.—Analysis determination, kinetic reaction and model building. *Separation and Purification Technology*, **54** (2), 253-261.

Full Text: [2007\Sep Pur Tec54, 253.pdf](2007/Sep%20Pur%20Tec54,%20253.pdf)

Abstract: Solid–liquid extraction was performed in a batch extractor, from aerial parts of Fumaria officinalis, in order to obtain an extract containing protopine. This study relates the influences of the temperature and nature of the solvent on the kinetics and rates of extraction. A method to quantify the protopine contents by Reverse Phase-High Pressure Liquid Chromatography was initially perfected. Then, a batch-extraction model based on the assumption of a second-order mechanism was developed to predict the rate constant of extraction, the saturated extraction capacity and the initial extraction rate with various temperatures in two solvents, water and ethanol 44% (w/w) in water. Furthermore, the activation energies were determined as based on the second-order rate constants of extraction used for the model building. The values resulting from these calculations and experiments were compared and discussed.

Keywords: Solid–Liquid Extraction, Fumaria, Kinetics, Protopine, Batch Experiment

? Yue, Q.Y., Li, Q., Gao, B.Y. and Wang, Y. (2007), Kinetics of adsorption of disperse dyes by polyepicholorohydrin-dimethylamine cationic polymer/bentonite. *Separation and Purification Technology*, **54** (3), 279-290.

Full Text: [2007\Sep Pur Tec54, 279.pdf](2007/Sep%20Pur%20Tec54,%20279.pdf)

Abstract: The characterization of polyepicholorohydrin-dimethylaminelbentonite and the kinetics of adsorption of four disperse dyes, namely, Disperse Yellow Brown S-2RFL (DYB S-2RFL), Disperse Red S-R (DR S-R), Disperse Blue SBL (DB SBL) and Disperse Yellow (DY SE-6GFL) onto organophilic bentonite (polyepicholorohydrin-dimethylamineibentonite) have been studied at various solution concentrations and temperatures. The adsorption kinetics was studied in terms of a two-step first-order kinetic rate equation and intra-particle diffusion model. The adsorption process has been found to follow with two different rate constants (k(1) and k(2)) for two-step first-order kinetic rate equation and also two different intra-particle diffusion rate constants (k(int1) and k(int2)) for intra-particle diffusion model. For both the kinetic steps, the energies of activation of adsorption (E-a1 and E-a2) and other thermodynamic parameters (Delta H-1\* and Delta H-2\*, Delta S-1\* and Delta S-2\*, Delta G(1)\* and Delta G(2)\*) have been calculated using Arrhenius’s and Eyring’s equation, respectively. It has been found that or both the adsorption kinetic steps, E-a1 and E-a2 are corresponding to the values of k(1) and k(2) and Delta H-1\* < -T-av Delta S-1\*, Delta H-2\* < -T-av Delta S-2\* and Delta G\* > 0, which means that the influence of entropy is more remarkable than enthalpy in activation reaction and the adsorption process is not spontaneous. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: EPI-DMA/Bentonite, Disperse Dyes, Adsorption Kinetics, Rate Constants, Thermodynamic Parameters, Aqueous-Solutions, Organic-Compounds, Activated Carbon, Sorption, Organoclays, Water, Acid, Acid-Blue-193, Bentonite, Biosorbent

? Malkoc, E. and Nuhoglu, Y. (2007), Potential of tea factory waste for chromium(VI) removal from aqueous solutions: Thermodynamic and kinetic studies. *Separation and Purification Technology*, **54** (3), 291-298.

Full Text: [2007\Sep Pur Tec54, 291.pdf](2007/Sep%20Pur%20Tec54,%20291.pdf)

Abstract: The objective of this study is to assess the uptake of hexavalent chromium Cr(VI) from aqueous solutions onto tea factory waste (TFW). The study also investigates the effects of process parameters such as pH, initial concentration of Cr(VI) ion, temperature, agitating rate and adsorbent mass. The nature of the possible adsorbent and metal ion interactions was examined by the FTIR technique. Zeta potential values of the TFW were defined at different values of pH according to deionized water. The maximum adsorption is noted at pH 2.0. The adsorption data follow the Langmuir model better than the Freundlich model and the adsorption equilibrium was described well by the Langmuir isotherm model with maximum adsorption capacity of 54.65 mg g−1 of Cr(VI) ions on TFW at 60 °C. Adsorption capacity increased from 30.00 to 39.62 mg g−1 with an increase in temperature from 25 to 60 °C at 400 mg L−1 of initial Cr(VI) ion concentration. The adsorption of Cr(VI) ions increased with increasing temperature indicating endothermic nature of the adsorption process. Using the first-order kinetic constants, the activation energy of adsorption (*E*a) was determined as 18.57 kJ mol−1 according to the Arrhenius equation. The present investigation aimed the heavy metal adsorption from synthetic wastewaters with another pollutant matter. This study indicated that the TFW can be used as an effective and environmentally friendly biosorbent for the treatment of Cr(VI) containing aqueous solutions. Various thermodynamic parameters, such as Δ*G*°, Δ*H*° and Δ*S*° have been calculated. The thermodynamics of Cr(VI) ion onto TFW system indicates spontaneous and endothermic nature of the process.

Keywords: Adsorption, Chromium(VI), Isotherms, Tea Factory Waste, Kinetics, Thermodynamic Parameters

? Chung, M.K., Tsui, M.T.K., Cheung, K.C., Tam, N.F.Y. and Wong, M.H. (2007), Removal of aqueous phenanthrene by brown seaweed *Sargassum hemiphyllum*: Sorption-kinetic and equilibrium studies. *Separation and Purification Technology*, **54** (3), 355-362.

Full Text: [2007\Sep Pur Tec54, 355.pdf](2007/Sep%20Pur%20Tec54,%20355.pdf)

Abstract: The batch sorption-kinetics and equilibrium uptake of phenanthrene (PHE), a hydrophobic organic compound (HOC), in aqueous compartment were investigated using dead tissue of brown seaweed Sargassum hemiphyllum under various conditions for 24 h. It was found that the higher the shaking rates (50-250 rpm) and temperatures (15-35°C), the higher the sorption rates of PHE, but no significant changes were observed for the maximum sorption capacities. Study with different initial PHE concentrations (50-1000 mu g L-1) showed that a higher ambient level of PHE resulted in a faster initial uptake rate and greater sorption capacity. The presence of ionic species (0.01-1 M NaCl) changed the sorption-kinetics of PHE markedly by altering the maximum removal of PHE, but not the initial sorption rates. No significant removal variations were noted under various initial pH (pH 2-11), while constant alkalinity resulted in an alleviated PHE sorption by Sargassum. The sorption- kinetics of PHE typically followed more closely to the pseudo- second-order model (r2 > 0.85) than pseudo-first-order equation (r2 > 0.72). Removal capacities were in the range of 430-460 mu g g-1 for tests spiked with 1000 mu g L-1 PHE. Typical percentage removals of aqueous PHE by Sargassum for all the investigated factors (e.g. initial pH and ionic strength) were in the range of 91.7-98.4%. Log Sargassum-water and the organic carbon normalized partition coefficient were calculated as 3.83 and 3.96 mL g-1, respectively. The present study provided valuable information for achieving optimal sorption of aqueous PHE using Sargassum as an effective sorbent for removing HOCs in wastewaters and urban runoffs. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alkalinity, Ambient, Biomass, Biosorption, Capacity, Carbon, Concentrations, Equilibrium, Heavy-Metals, Highway Runoff, HOCs, Hydrophobic, Information, Ionic Species, Ionic Strength, Kinetics, Macroalgae, Model, Organic, Organic Carbon, Organic Matter, Organic-Matter, Pahs, Partition, Partition Coefficient, pH, Phenanthrene, Pollutants, Polycyclic Aromatic-Hydrocarbons, Range, Removal, Sargassum, Seaweed, Sediments, Sorption, Sorption Capacity, Sorption Kinetics, Strength, Tests, Uptake, Urban, Waters

? Huang, Y.H., Hsueh, C.L., Huang, C.P., Su, L.C. and Chen, C.Y. (2007), Adsorption thermodynamic and kinetic studies of Pb(II) removal from water onto a versatile Al2O3-supported iron oxide. *Separation and Purification Technology*, **55** (1), 23-29.

Full Text: [2007\Sep Pur Tec55, 23.pdf](2007/Sep%20Pur%20Tec55,%2023.pdf)

Abstract: The use of versatile sorbents has been investigated for wastewater treatment. An investigation into the use of activated alumina-supported iron oxide (denoted as FeAA), which is a by-product of the wastewater treatment plant. In our previous study, the FeAA has successfully been as heterogeneous photoassisted Fenton catalyst for degradation azo dye at neutral pH 7.0. In this work, the test and use of FeAA as adsorbent for the removal of lead (Pb2+) from water are carried out. The highest Pb2+ adsorption capacity was determined as 0.14 mmol g-1 for 0.8 mmol dm-3 initial Pb2+ concentration at pH 5.0 and 318 K. Adsorption data were well described by the Langmuir model and the thermodynamic constants of the adsorption process: ΔG°, ΔH° and ΔS° were evaluated as -19.4 kJ mol-1 (at 318 K), 25.73 kJ mol-1 and 0.113 J mmol-1 K-1, respectively. The pseudo-first-order and pseudo-second-order kinetic models were applied to test the experimental data. The pseudo-second-order kinetic model provided the best correlation of the experimental data compared to the pseudo-first-order model. © 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Process, Azo Dye, Capacity, Carbon, Catalyst, Catalytic-Oxidation, Concentration, Correlation, Degradation, Desorption, Dye, Equilibrium, Fenton, Fluidized-Bed Reactor, Goethite, Heavy-Metals, Heterogeneous, Investigation, Iron, Iron Oxide, Kinetic, Kinetic Model, Kinetic Models, Kinetic Studies, Langmuir, Langmuir Model, Lead, Lead, Mechanisms, Model, Models, Natural Organic-Matter, Pb(II), Pb2+, pH, Plant, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Sorbents, Test, Thermodynamic, Treatment, Wastewater, Wastewater Treatment, Wastewater Treatment Plant, Water

? Razah, M., Zhao, Y.Q. and Bruen, M. (2007), Effectiveness of a drinking-water treatment sludge in removing different phosphorus species from aqueous solution. *Separation and Purification Technology*, **55** (3), 300-306.

Full Text: [2007\Sep Pur Tec55, 300.pdf](2007/Sep%20Pur%20Tec55,%20300.pdf)

Abstract: Drinking-water treatment sludge (DWTS) produced at water treatment plants is an inescapable byproduct and has long been treated as a waste for landfill. In this study, a series of batch adsorption tests were conducted using it wide range of phosphorus (P) species to determine the adsorption capacities of freshly dewatered aluminium salt based DWTS. The adsorption process is highly dependant on the pH of the suspension and is good at low pHs with adsorption capacities in the order of orthophosphate > polyphosphate > organic phosphate when these three P species were simulated according to their level in typical municipal wastewater. At pH 4.0, the adsorption capacity for orthophosphate was 10.2 Mg-PO43-/g DWTS, polyphosphate was 7.4 Mg-PO43-/g DWTS and organic phosphate was 4.8 Mg-PO43-/g DWTS. Subsequently, a continuous flow column test with dewatered Al-based DWTS as filter medium was conducted at a hydraulic loading of 2.79 m(1)/m(2) d and an extremely high P loading of 210.5 PO43-/m(2) d. The sludge bed remained stable and removed over 80% P in a 30 day period and the bed did not reach saturation point for over 60 days. This proves the potential of the sludge as a filter material in various forms of P immobilization, thus converting it from a waste to a useful material in pollutant control. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alummium, Drinking Water Treatment Sludge, Phosphorus Removal, Reuse, Treatment Works Sludge, Dewatered Alum Sludge, Waste-Water, Treatment Residuals, Competitive Adsorption, Phosphate Adsorption, Constructed Wetlands, Mechanisms, Retention, Capacity

? Ramesh, A., Hasegawa, H., Maki, T. and Ueda, K. (2007), Adsorption of inorganic and organic arsenic from aqueous solutions by polymeric Al/Fe modified montmorillonite. *Separation and Purification Technology*, **56** (1), 90-100.

Full Text: [2007\Sep Pur Tec56, 90.pdf](2007/Sep%20Pur%20Tec56,%2090.pdf)

Abstract: Adsorption of arsenite [As(III)], arsenate [As(V)] and dimethylarsinate (DMA) from aqueous solutions onto polymeric Al/Fe modified montmorillonite was studied. Batch adsorption studies were carried out on the adsorption of As(III), As(V) and DMA as a function of contact time, pH, adsorbent dose and initial metal concentration. Fourier transform infrared spectrometry (FT-IR) and scanning electron microscopy (SEM) were used to analyze the functional groups and surface morphology of the montmorillonite or polymeric Al/Fe modified montmorillonite, respectively. SEM images show that modification with polymeric Al/Fe species reduces the clay particle size and aggregation. The results indicate that the maximum adsorption of polymeric Al/Fe modified montmorillonite was obtained in the pH range 3.0-6.0 for As(V), 7.0-9.0 for As(III) and 3.0-7.0 for DMA. The adsorption data was analyzed by both Freundlich and Langmuir isotherm models and the data was well fit by the Freundlich isotherm model. Kinetic data correlated well with the pseudo-second-order kinetic model, suggesting that the adsorption process might be chemical sorption. Thermodynamic studies showed that the adsorption process was endothermic and spontaneous in nature. The presence of phosphate and iron reduced the adsorption efficiency of arsenic, whereas other common coexisting ions had no significant effect on arsenic adsorption. The desorption studies were carried out using dilute NaCl solution. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Efficiency, Adsorption Process, Aggregation, Aqueous Solutions, Arsenate, Arsenic, Arsenic Adsorption, Arsenite, As(III), As(V), Blackfoot Disease, Chemical, Clay, Concentration, Contact Time, Desorption, Desorption Studies, Dimethylarsinic Acid, Dma, Drinking-Water, Efficiency, Electron Microscopy, Endothermic, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Function, Functional, Functional Groups, Groundwater, Groups, Heavy-Metal Removal, Inorganic, Iron, Iron-Oxides, Isotherm, Isotherm Model, Isotherm Models, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir-Isotherm, Metal, Microscopy, Model, Models, Modification, Modified, Montmorillonite, Morphology, Nacl, Organic, Particle, Particle Size, pH, Phosphate, Polymeric, Polymeric Al, Fe, Polymeric Al, Fe Modified Montmorillonite, Polymeric Al, Fe Species, Process, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Range, Scanning Electron Microscopy, Sem, Size, Solutions, Sorption, Species, Spectrometry, Spontaneous, Surface, Surface Morphology, Surfactant-Modified Montmorillonite, Titanium-Dioxide, Waste-Water

? Pimentel, P.M., González, G., Melo, M.F.A., Melo, D.M.A., Silva, Jr., C.N. and Assunção, A.L.C. (2007), Removal of lead ions from aqueous solution by retorted shale. *Separation and Purification Technology*, **56** (3), 348-353.

Full Text: [2007\Sep Pur Tec56, 348.pdf](2007/Sep%20Pur%20Tec56,%20348.pdf)

Abstract: The equilibrium and kinetic properties of Pb2+ ion adsorption by retorted shale (RS) have been investigated during a series of batch adsorption experiments. The effects of pH, contact time and adsorbate initial concentration were evaluated. The pseudo-second-order model was used to predict the rate constants of adsorption system. Langmuir and Freundlich models were used to fit the equilibrium data, which showed that Langmuir best-fitted these data. Thermodynamic parameters of adsorption indicate spontaneous and endothermic nature of the process. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Aqueous Solution, Ash, Batch, Batch Adsorption, Clay, Concentration, Constants, Contact Time, Effects, Effects of pH, Endothermic, Equilibrium, Equilibrium Data, Freundlich, Heavy-Metals, Ion, Ion Adsorption, Kinetic, Kinetic Properties, Langmuir, Lead, Lead Ions, Metal-Ions, Model, Models, Parameters, Pb2+, pH, Predict, Process, Properties, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate, Rate Constants, Retorted Shale, RS, Shale, Sorption, Spontaneous, Time, Waste-Water

? Kumar, G.P., Kumar, R.A., Chakraborty, S. and Ray, M. (2007), Uptake and desorption of copper ion using functionalized polymer coated silica gel in aqueous environment. *Separation and Purification Technology*, **57** (1), 47-56.

Full Text: [2007\Sep Pur Tec57, 47.pdf](2007/Sep%20Pur%20Tec57,%2047.pdf)

Abstract: A resinous functionalized polymer, aniline formaldehyde condensate (AFC) coated on silica gel was used as an adsorbent to remove copper (Cu2+) from aqueous solution under conditions of different initial Cu2+ concentration, adsorbent loading, pH and adsorption time. Coordination bond formation between amine group and Cu2+ ion was the main mechanism of copper removal. Adsorption increased from 20% at pH 4 to 71% at pH 6 due to less competition from proton. Adsorption equilibrium was achieved within 120-150 min. The kinetics of adsorption followed second order model with rate constant of 0.0021 g/mg min. The adsorption data gave good fit with Langmuir isotherm and yielded Langmuir monolayer isotherm uptake of 76.33 mg/g and adsorption equilibrium parameter of 0.022 L/mg at solution pH of 5.4-5.7 and temperature of 22-25°C. During desorption studies 97-100% of adsorbed copper ion released in solution in presence of IN strength of mineral acids HCl, H2SO4 and HNO3. Dynamic study shows that column breakthrough was achieved at 264 bed volume at initial Cu2+ of 25 mg/L. Further studies are recommended on regeneration and reuse of AFC coated silica gel after desorption of copper ion. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acids, Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption Time, Amine, Amine Group, Aniline, Aqueous Solution, Breakthrough, Cadmium, Coated Silica, Column, Competition, Concentration, Condensate, Coordination Bond, Copper, Copper Ion, Copper Removal, Copper Uptake And Desorption, Cu(II), Cu2+, Desorption, Desorption Studies, Environment, Equilibrium, Formaldehyde, Formation, Functionalized Polymer, Gel, Group, H2SO4, HCl, Heavy-Metals, HNO3, Ion, Isotherm, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Langmuir Monolayer, Langmuir-Isotherm, Loading, Mechanism, Mineral, Model, Monolayer, Order, pH, Polyethyleneimine, Polymer, Proton, Rate, Rate Constant, Regeneration, Removal, Reuse, Second Order, Silica, Silica Gel, Solution pH, Sorption, Strength, Temperature, Time, Tree Fern, Uptake, Waste-Water

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Full Text: [2007\Sep Pur Tec57, 121.pdf](2007/Sep%20Pur%20Tec57,%20121.pdf)

Abstract: The adsorption of papain on the dye affinity membranes, the Cibacron Blue F3GA as a ligand, and the chitosan-coated nylon membrane as a base, under batch equilibrium experimental conditions at 277, 298, and 310K was investigated. The experimental data were analyzed using two adsorption kinetic models: the pseudo-first-order and the pseudo-second-order. The pseudo-second-order kinetic model provided the better correlation to the experimental results. Studies showed that the adsorption of papain on dye affinity membranes could be described by the Freundlich isotherm. The thermodynamic constants of adsorption phenomena: ΔG°, ΔH°, and ΔS° were found as -12.58 kJ/mol (at 298 K), 17.81 kJ/mol, and 0.101 kJ/(mol K), respectively. The result shows that the adsorption of papain on the dye affinity membranes was endothermic and spontaneous. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: 298 K, 298-K, Adsorption, Adsorption Kinetic, Affinity, Affinity Membranes, Analysis, Base, Batch, Batch Equilibrium, Batch-Equilibrium, Biosorption, Chromatography, Cibacron Blue, Cibacron Blue F3ga, Constants, Correlation, Dye, Dye Affinity, Dye Affinity Membrane, Endothermic, Equilibrium, Experimental, Experimental Data, Freundlich, Freundlich Isotherm, G, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Ligand, Lysozyme, Membrane, Membranes, Model, Models, Nylon, Papain, Phema, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Purification, Separation, Spontaneous, Thermodynamic, Thermodynamic Analysis

? Preetha, B. and Viruthagiri, T. (2007), Batch and continuous biosorption of chromium(VI) by *Rhizopus arrhizus*. *Separation and Purification Technology*, **57** (1), 126-133.

Full Text: [2007\Sep Pur Tec57, 126.pdf](2007/Sep%20Pur%20Tec57,%20126.pdf)

Abstract: Biosorption of chromium using suspended and immobilized cells of Rhizopus arrhizus was studied by evaluating the physicochemical parameters of the solution such as initial chromium ion concentration in both batch and packed bed reactor. The Langmuir, Freundlich and Redlich-Peterson adsorption isotherm models were used in the equilibrium modeling. The Freundlich and Redlich-Peterson adsorption isotherm models were found to fit accurately with the experimental data. Batch experiments demonstrate that the sorption process corresponds to the second-order kinetic model and the kinetics of sorption indicates the process to be diffusion controlled. The diffusivity of chromium in Rhizopus-alginate gel beads was calculated using the shrinking core model, and the diffusivity values were in the ranges of 0.049×10-5 to 0.521×10-5 cm2 s-1. A good fit was found in the case of controlling intraparticle diffusion for the sorption of chromium. Thomas model, Adams-Bohart and Wolborska models were used to represent the dynamic sorption of chromium using immobilized beads and the model parameters were evaluated using experimental data. The Thomas model represents well the sorption of chromium at different residence times whilst Adams-Bohart model was fitted better at the initial part of the breakthrough. Wolborska model also represents the sorption of chromium accurately. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adams-Bohart Model, Adsorption, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous-Solution, Batch, Beads, Bed, Biomass, Biosorption, Breakthrough, Cells, Chromium, Chromium Ion, Chromium(VI), Concentration, Copper, Core, Diffusion, Diffusivity, Dynamic, Dynamic Sorption, Equilibrium, Equilibrium Modeling, Experimental, Experimental Data, Experiments, Freundlich, Gel, Gel Beads, Immobilized, Immobilized Cells, Intraparticle Diffusion, Ion, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Modeling, Kinetics, Kinetics of Sorption, Langmuir, Model, Modeling, Models, Packed Bed, Parameters, Phenol, Physicochemical, Process, Reactor, Redlich-Peterson, Removal, Rhizopus Arrhizus, Second Order, Shrinking Core, Shrinking Core Model, Sorption, Thomas, Thomas Model

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Full Text: [2007\Sep Pur Tec57, 161.pdf](2007/Sep%20Pur%20Tec57,%20161.pdf)

Abstract: This study puts forward a novel method to prepare granular red mud (GRM) and evaluates its potential use to remove cadmium ions from aqueous solutions as a low-cost adsorbent. The properties of the novel adsorbent were examined and then used for cadmium adsorption experiments. Batch experiments were conducted and equilibrium isotherms at different temperatures (20°C, 30°C, 40°C) have been determined and analyzed with a Freundlich model. Kinetics data at initial pH 6.0 and 3.0 were fitted with Pseudo-second-order model and external mass transfer coefficients, effective particle diffusion coefficients were subsequently calculated for cadmium-GRM system at initial pH 6.0. Column breakthrough curves were depicted and the data were analyzed with a Thomas model. The column adsorption was reversal and the regeneration operation was accomplished by pumping 0.1 mol/L hydrochloric acid through the adsorbed column. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Aqueous Solutions, Breakthrough, Breakthrough Curves, Cadmium, Cadmium Adsorption, Cadmium Ions, Cd(II), Column, Column Adsorption, Copper(II), Diffusion, Diffusion Coefficients, Dye, Effective, Equilibrium, Equilibrium Isotherms, Experiments, External Mass Transfer, Freundlich, Freundlich Model, Granular, Granular Red Mud, GRM, Heavy-Metals, Hydrochloric Acid, Ions, Isotherms, Kinetics, Low Cost Adsorbent, Low-Cost Adsorbent, Mass, Mass Transfer, Mass Transfer Coefficients, Mass-Transfer, Method, Model, Mud, Operation, Particle, Particle Diffusion, pH, Potential, Properties, Red Mud, Regeneration, Sawdust, Solutions, Sorption, Temperatures, Thomas, Thomas Model, Transfer, Waste

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Full Text: [2007\Sep Pur Tec57, 193.pdf](2007/Sep%20Pur%20Tec57,%20193.pdf)

Abstract: In the present study we reported by the first time the feasibility of yellow passion-fruit shell (YPFS- Passiflora edulis Sims. f. flavicarpa Degener) as an alternative biosorbent to remove Cr(III) and Pb(II) metallic ions from aqueous solutions. The ability of YPFS to remove Cr(III) and Pb(II) was investigated by using batch biosorption procedure. The effects such as contact time and pH on the biosorption capacities were studied. The biosorption kinetics followed the pseudo second-order kinetic model, obtaining the following biosorption constant rates, 1.48×10-2 and 4.70×10-3 g mg-1 min-1 using a 5.0 mg l-1 metallic ion solution, for Cr(III) and Pb(II), respectively. The maximum biosorption capacity of YPFS were 85.1 and 151.6 mg g-1 for Cr(III) and Pb(II), respectively. This high biosorption capacity of YPFS places this biosorbent as one of the best biosorbents for removal or Cr(III) and Pb(II) from aqueous effluents. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Aqueous Solutions, Batch, Batch Biosorption, Batch Conditions, Biosorbent, Biosorbents, Biosorption, Biosorption, Biosorption Capacities, Biosorption Capacity, Biosorption Kinetics, Capacity, Chromium, Contact Time, Cr(III), Effects, Effluents, Heavy-Metals, Industrial-Waste, Ion, Isotherms Model, Kinetic, Kinetic Model, Kinetic of Biosorption, Kinetics, L(1), Lead, Low-Cost Adsorbent, Low-Cost Sorbents, Mandarin Peels, Metallic, Metallic Ions, Model, Pb(II), pH, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo Second-Order, Pseudo-Second-Order, Removal, Second Order, Shell, Solutions, Statistical Design, Time, Toxic Metals, Yellow Passion-Fruit Shell

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Full Text: [2007\Sep Pur Tec57, 250.pdf](2007/Sep%20Pur%20Tec57,%20250.pdf)

Abstract: In the present study a carboxylated polymeric adsorbent ZK-1 was synthesized for enhanced removal of p-nitroaniline (PNA) from aqueous solution. A commercial polymeric adsorbent XAD-4 was selected for comparison purpose. Characterization of ZK- I was characterized by infrared spectroscopy and pore size distribution analysis. Experimental results showed that PNA adsorption onto ZK- I was greatly enhanced due to its micropore structure and the carboxylic group introduced onto polymeric matrix. Different pH-dependent adsorption tendency of PNA onto XAD-4 and ZK- I was observed mainly due to the role of carboxyl group on the ZK- I surface. Isotherms of PNA adsorption onto ZK- I and XAD-4 could be represented by Langmuir model reasonably. More favorable PNA adsorption onto ZK- I than X AD-4 was further demonstrated by thermodynamic ananlysis. Kinetic studies demonstrated that PNA uptake onto ZK-1 followed the pseudo-second order model, while that onto XAD-4 would be more suitably represented by the pseudo-first order model. Column adsorption runs indicated that PNA could be completely removed from aqueous system by ZK-1. Moreover, efficient regeneration of the spent adsorbent ZK- I was readily achieved by ethanol and water for its repeated use. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: 4-Nitroaniline, Activated Carbon, Adsorbent, Adsorption, Adsorption Enhancement, Analysis, Aqueous Solution, Aqueous-Solutions, Breakthrough Curves, Carboxyl, Carboxyl Group, Carboxylation, Chlorophenols, Comparison, Distribution, Ethanol, Exchange Resins, Group, Infrared Spectroscopy, Kinetics, Langmuir, Langmuir Model, Matrix, Micropore, Model, Order, Phenolic-Compounds, Polymeric, Polymeric Adsorbent, Pore, Pore Size, Pore Size Distribution, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Regeneration, Removal, Role, Size, Size Distribution, Size Distribution Analysis, Sorbents, Spectroscopy, Structure, Surface, Thermodynamic, Uptake, Waste-Water, Water, XAD-4

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Full Text: [2007\Sep Pur Tec57, 394.pdf](2007/Sep%20Pur%20Tec57,%20394.pdf)

Abstract: NOC, a byproduct obtained after extraction of oil from neem fruit was used as an adsorbent for the removal of Pb(II) from wastewater. The adsorption of Pb(II) was found to be maximum (98%) at pH 4. The lower value of Langmuir constant (b) indicates strong binding of Pb(II) on NOC surface. The Freundlich constant n indicates beneficial adsorption. Thermodynamic parameters (ΔH° and ΔG°) suggest endothermic and spontaneous process. Kinetic studies show better applicability of second order kinetic model. The practical utility of NOC was demonstrated by removing Pb(II) along with Cd(II) and Cu(II) from single metal and multimetal systems by batch and column process. It was found that removal efficiency of NOC was better by column operation in multimetal system. The breakthrough capacities of Cu(II), Cd(II) and Pb(II) on NOC are found to be 10, 15 and 30 mg/g, respectively. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Batch, Binding, Biomass, Biosorption Equilibria, Breakthrough, Breakthrough Capacity, Cadmium, Cake, Cd(II), Column, Column Operation, Copper, Cu(II), Efficiency, Endothermic, Extraction, Freundlich, Fruit, G, Heavy-Metals, Ions, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead, Metal, Model, Multimetal System, Oil, Operation, Order, Parameters, Pb(II), Pb(II) Ions, P, Process, Recovery, Removal, Removal Efficiency, Removing, Second Order, Sorption, Spontaneous, Surface, Thermodynamics, Utility, Value, Waste-Water, Wastewater, Zinc

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Full Text: [2007\Sep Pur Tec58, 17.pdf](2007/Sep%20Pur%20Tec58,%2017.pdf)

Abstract: Mn oxide-coated carbon nanotubes (MnO2/CNTs) were prepared and used to remove Pb(II) from aqueous solution. The XRD revealed that MnO2 covered MnO2/CNTs was an amorphous phase. The Pb(II) removal capacity of MnO2/CNTs decreased with the decrease of pH. From the Langmuir isotherms, maximum adsorption capacity (Q(0)) of MnO2/CNTs towards Pb(II) was determined (Q(0) = 78.74 mg/g). Comparing with CNTs, significant improvement of Pb(II) adsorption shows MnO2/CNTs can be good Pb(II) absorbers. Although Pb(II) adsorption by MnO2/CNTs occurred rapidly within the first 15 min of contact time, contact time needed at least 2 It in order to attain adsorption equilibrium and the kinetic adsorption can be described by the pseudo-second-order rate equation. Thermodynamics of Pb(II) was studied at various temperatures of 283, 303 and 323 K and the thermodynamic parameters were also determined. (c) 2007 Published by Elsevier B.V.

Keywords: Adsorption, Cadmium Removal, Carbon Nanotubes, Chitin, Column, Copper(II), Equilibrium, Fixed-Bed, Granular Activated Carbon, Heavy-Metals, Manganese Oxide Coated, Pb(II), Water, Zeolite

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Full Text: [2007\Sep Pur Tec58, 32.pdf](2007/Sep%20Pur%20Tec58,%2032.pdf)

Abstract: The increasing use of organic compounds endangering the environment encourages search for more efficient adsorbents. Clays are natural environment-friendly materials with high specific surface area and now widely used for the adsorption and removal of the organic pollutants. In the present review, the adsorption properties of the raw clays, activated clays by acid-treatment or calcinations, organic-modified clays with small molecules or polymers for the adsorption and removal of organic dyes from aqueous solutions are reviewed. The development perspectives are also proposed. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Organic Dyes, Clay Nano-Adsorbent, Review, Cationic Cyanine Dye, Solid Thin-Films, Methylene-Blue, Rhodamine 6G, Acid Dye, Activated Montmorillonite, Absorption-Spectroscopy, Polymer Nanocomposites, Model-Calculations, Interlayer Space

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Full Text: [2007\Sep Pur Tec58, 49.pdf](2007/Sep%20Pur%20Tec58,%2049.pdf)

Abstract: Carbon nanotubes (CNTs) were employed as adsorbent to study the adsorption characteristics of some divalent metal ions (Cu, Co, Cd, Zn, Mn, Pb). The effect of solution conditions such as pH and metal ions concentration was investigated. At pH 9 the affinity order of the metal ions towards CNTs is Cu(II) > Pb(II) > Co(II) > Zn(II) > Mn(II). The Freundlich adsorption model agrees well with experimental data. Our results suggest that CNTs have good potential application in environmental protection. (c) 2007 Published by Elsevier B.V.

Keywords: Carbon Nanotubes, Adsorption, pH Effect, Heavy Metal Ions, Preconcentration, Removal, Sorbents, Water, Pb2+

? Rao, G.P., Lu, C. and Su, F. (2007), Sorption of divalent metal ions from aqueous solution by carbon nanotubes: A review. *Separation and Purification Technology*, **58** (1), 224-231.

Full Text: [2007\Sep Pur Tec58, 224.pdf](2007/Sep%20Pur%20Tec58,%20224.pdf)

Abstract: In this article, the technical feasibility of various kinds of raw and surface oxidized carbon nanotubes (CNTs) for sorption of divalent metal ions (Cd2+, CU2+, Ni2+, Pb2+, Zn2+) from aqueous solution is reviewed. The sorption mechanisms appear mainly attributable to chemical interactions between the metal ions and the surface functional groups of the CNTs. The sorption capacities of CNTs remarkably increased after oxidized by NaOCl, HNO3 and KMnO4 solutions and such surface oxidized CNTs show great potential as superior sorbents for environmental protection applications. Effects of process parameters, such as CNT characterizations (surface area, pore size distribution, sorbent mass, and surface total acidity), solution properties (ionic strength, pH, initial sorbate concentration and temperature) and competition for sorption sites by multiple metal ions, on the performance of CNTs are addressed in some detail. The recovery of metal ions and the regeneration of CNTs can be achieved using acid elution with little effect on the CNT performance. The utilization of CNTs for the treatment of water and wastewater containing divalent metal ions is gaining more attention as a simple and effective means of pollution control. Future research works on developing a cost-effective way of CNT production and testing the toxicity of CNTs and CNT-related materials are recommended. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Carbon Nanotubes, Chemical Treatment, Heavy Metal Ions, Sorption, Anodic-Stripping Voltammetry, Activated Carbon, Equilibrium Adsorption, Lead(II) Ions, Heavy-Metals, Waste-Water, Fly-Ash, Removal, Biosorption, Adsorbent

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Full Text: [2008\Sep Pur Tec58, 311.pdf](2008/Sep%20Pur%20Tec58,%20311.pdf)

Abstract: In this work, a novel multi-stage external loop airlift reactor has been designed to remove phenol from wastewater by means of its adsorption onto the surface of activated carbons. The multi-staging has been achieved by hydrodynamically induced continuous bubble generation, breakup and regeneration. The continuous rupture and bursting of bubbles creates localized turbulence and recirculation, which helps in faster transfer of trace pollutants to the active sites of the solid adsorbents. Thus, the pollutants get adsorbed to the surface of the solid adsorbents due to continuous agitation. Different operating parameters that affect the performance of the reactor are the superficial gas velocity, liquid circulation velocity, concentration of the pollutant present in wastewater, contact time and the carbon loading. The results show that the removal time as well as the activated carbon loading for this system were quite lower as compared to simple batch adsorption systems. The kinetic data were fitted to the models of intra-particle diffusion, pseudo-second-order and Lagergren, and followed more closely the Lagergren pseudo-first-order model. Langmuir and Freundlich models were used to study the adsorption isotherms. A correlation has been developed to predict the efficiency of percentage removal of phenol and found to be highly significant from statistical point of view. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption, Adsorption Isotherms, Carbon, Diffusion, Intra-Particle Diffusion, Isotherms, Kinetic, Kinetics, Langmuir, Multi-Stage External Loop Airlift Reactor, Phenol, Phenol Removal, Removal, Scrubber, Wastewater, Wastewater Treatment

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Full Text: [2008\Sep Pur Tec58, 335.pdf](2008/Sep%20Pur%20Tec58,%20335.pdf)

Abstract: The adsorption and photocatalysis kinetics of metsulfuron-methyl (MM) onto titanium oxide (TiO2) and powdered activated carbon (PAC) were studied at varying adsorbent amount and MM concentration. The overall mass transfer in adsorption was estimated from concentration decay curves obtained in the batch adsorber. The maximum adsorption capacity decreased with increasing adsorbent amount in TiO2 adsorption. The adsorption isotherms of MM could be plotted using the Langmuir isotherm model with a reasonable degree of accuracy having higher r2 values rather than Freundlich isotherm model. Linear driving force approximation (LDFA) kinetic equation with Langmuir adsorption isotherm model was successfully applied to predict the adsorption kinetics data in various concentrations of MM in photobatch reactor. The estimated mass transfer coefficient was used to be 3.0×10-5, 5.5×10-5, 9.1×10-5 m/s in PAC adsorption and 2.0×10-5, 1.1×10-5, 9.0×10-6 m/s in TiO2 adsorption for a different MM concentration of 20, 50 and 70 mg/L, respectively. Photocatalysis kinetics was same with TiO2 of 0.2 g/L regardless of TiO2 amounts and the MM degradation kinetics was enhanced by TiO2 catalysis rather than only UV light degradation. Among the photocatalysis kinetics model with first-order, second-order and Langmuir-Hinshelwood (L-H) model, a second-order kinetic model was found to well present the experimental data of MM by TiO2 catalyst for the range of various TiO2 amounts and MM concentration studied. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Carbon, Degradation, Freundlich Isotherm, Herbicide, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Mass Transfer, Metsulfuron Methyl, Metsulfuron-Methyl, Photocatalysis, Powdered Activated Carbon, Removal, Titanium Oxide, Transfer Coefficient, Water

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Full Text: [2008\Sep Pur Tec58, 353.pdf](2008/Sep%20Pur%20Tec58,%20353.pdf)

Abstract: Heavy metals and humic acid are two important pollutants in surface and waste water systems. In this study, fly ash, an industrial waste, is used as a low-cost adsorbent for simultaneous removal of heavy metals and humic acid. The investigations were conducted for individual pollutant adsorption along with co-adsorption of both pollutants. It is found that, for single pollutant system, fly ash can achieve adsorption of lead ion at 18 mg/g, copper ion at 7 mg/g and humic acid at 36 mg/g, respectively. For co-adsorption, complexation of heavy metals and humic acid plays an important role. The presence of humic acid in water will provide additional binding sites for heavy metals, thus promoting metal adsorption on fly ash. For Pb-HA and Cu-HA systems, Pb2+ and Cu2+ adsorption can increase to 37 and 28 mg/g, respectively, at pH 5 and 30°C. However, the heavy metal ions present in the system will compete with the adsorption of humic acid on fly ash, thus resulting in a decrease in humic acid adsorption. For all cases, dynamic adsorption can be described by the first-order and second-order kinetics. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Co-Adsorption, Complexation, Copper, Fly Ash, Fulvic-Acid, Heavy Metal, Heavy Metal Ions, Heavy Metals, Humic Acid, Immobilization, Kinetics, Lead, Metal, Metal Adsorption, Metal Ions, Metals, pH, Removal, Sorption, Ultrafiltration, Waste Water, Water

? Lei, L.C., Li, X.J. and Zhang, X.W. (2008), Ammonium removal from aqueous solutions using microwave-treated natural Chinese zeolite. *Separation and Purification Technology*, **58** (3), 359-366.

Full Text: [2008\Sep Pur Tec58, 359.pdf](2008/Sep%20Pur%20Tec58,%20359.pdf)

Abstract: In this study, natural Chinese zeolite pretreated by sodium chloride solution under microwave irradiation was used to remove ammonium from aqueous solution. Adsorption kinetics, adsorption equilibrium isotherms and the effect of the individual presence of other cations and humic acid on the removal of ammonium were investigated by conducting a series of batch experiments. The zeolite treated under microwave irradiation had the highest ammonium adsorption capacity value, followed by the zeolite obtained by thermal process and the untreated zeolite. The kinetic studies confirmed that the adsorption of ammonium on the zeolite treated under microwave irradiation could be described by the pseudo-second-order kinetic model, and intra-particle diffusion controlled the limiting rate of the adsorption process. Five isotherm models were used to describe the isotherm data. Three-parameter isotherm models (Redlich-Peterson and Langmuir-Freundlich) provided much better isotherm data fitting than two-parameter isotherm models (Freundlich, Temkin and Langmuir). The presence of Na+, K+, Ca2+ and Mg2+ could reduce the uptake of ammonium onto the zeolite treated under microwave irradiation and the order of ammonium ion over other cations was Na+ > K+ > Ca2+ > Mg2+, while the presence of humic acid increased the uptake of ammonium. Due to their low cost, high adsorption capacity and selectivity, the zeolite treated under microwave irradiation has the potential to be utilized for cost-effective removal of ammonium from wastewater. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Equilibrium, Ammonium Removal, Aqueous Solution, Aqueous Solutions, Chloride, Diffusion, Equilibrium, Humic Acid, Intra-Particle Diffusion, Ion-Exchange, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Microwave, Recovery, Removal, Solution, Sorption, Transcarpathian Clinoptilolite, Waste-Water, Wastewater, Zeolite

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Full Text: [2008\Sep Pur Tec59, 101.pdf](2008/Sep%20Pur%20Tec59,%20101.pdf)

Abstract: This study evaluates how the characteristics of activated carbon (AC) influence the adsorption-reduction of bromate (BrO3-) by performing kinetic and isotherm tests. Experimental results reveal that both physical and chemical effects simultaneously affect the adsorption-reduction process. The wood-based carbons contained more mesopores than coconut- and coal-based carbons, resulting in the adsorption of more BrO3-. The equilibrium- and maximum-adsorption capacities were calculated as a function of the effect of mesopore volume. The carbon surface chemistry seems to be significant in the adsorption-reduction process. Activated carbons with high pH(zpc) values and many basic groups exhibit a neutral or positive charge under typical pH conditions, promoting BrO3- adsorption-reduction at the carbon surface. The kinetic data obtained from three forms of carbons have been analyzed using three kinetic models-pseudo-first-order, pseudo-second-order and intraparticle diffusion models. Among the kinetic models studied, the intraparticle diffusion was the best applicable model to describe the adsorption of BrO3- onto AC. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetic, Bromate, Bromide-Containing Waters, Carbon, Chemistry, Diffusion, Equilibrium, Isotherm, Kinetic, Kinetic Models, Mesopore, Ozonation, pH, Pore Size, Potassium Bromate, Rats, Removal, Surface-Chemistry, Systems, Tumors

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Full Text: [2008\Sep Pur Tec60, 264.pdf](2008/Sep%20Pur%20Tec60,%20264.pdf)

Abstract: The main purpose of the present work was to study the simultaneous removal of 3d transition metals from multi-component solutions by novel porous material obtained from carbon-containing liquid and solid waste. The activated carbon was prepared from co-mingled natural organic waste: 25% sunflower husks, 50% petroleum waste and 25% low-grade bituminous coal. The porous carbon material was obtained via stages of pre-oxidation with binary eutectic Na/K carbonates (in order to avoid melting and coke formation), followed by “step by step” carbonization at 100-400°C in an inert atmosphere and activation with steam at 850°C. The adsorption of the 3d transition metals: copper(II), cobalt(III), nickel(II), iron(III), and chromium(III), on novel activated carbons has been investigated using multi-component model solutions. Experiments have been carried out on the thermodynamics of the simultaneous adsorption of the 3d transition metals in a static mode. The total metal removal combines the process of metal hydroxide precipitation in the solution with the metal cation adsorption on negatively charged carbon surface in a single operation unit. The carbon/metals interaction at the surface of spent adsorbents is discussed. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: 3d Transition Metals, Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Aqueous-Solutions, Atmosphere, Cadmium, Carbon, Carbonization, Cation, Chromium, Coal, Cobalt, Copper, Cr(III) Adsorption, Equilibrium, Heavy-Metals, Interaction, Ion Adsorption, Iron, Kinetics, Liquid, Metal, Metals, Mode, Model, Nickel, Operation, Organic, Organic Waste, Petroleum Waste, Porous Carbon, Precipitation, Purpose, Removal, Rights, Solid Waste, Solution, Solutions, Surface, Thermodynamics, Waste, Water, Work, X-Ray Photoelectron Spectroscopy, Zinc

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Full Text: [2008\Sep Pur Tec61, 153.pdf](2008/Sep%20Pur%20Tec61,%20153.pdf)

Abstract: The aim of this research work is to investigate sorption characteristic of beach sand for the removal of Zn(II) ions from aqueous solutions. The sorption of Zn(II) ions by batch dynamic method is carried out using dilute solutions (10-4 M) of nitric, hydrochloric and perchloric acids along with deionized water and from buffers of pH 2-10. Maximum sorption is noticed from deionized water (88.3%) using 30min shaking time. Two equations, i.e. Morris-Weber and Lagergren have been tested to track the kinetics of removal process. The Langmuir, Freundlich and Dubinin-Radushkevich (D-R) model are subjected to sorption data to estimate sorption capacity, intensity and energy. The thermodynamic parameters Delta H, Delta S and Delta G are evaluated. The influence of common ions on the sorption of Zn(II) ions is also examined. Some ions reduce the sorption while most of the ions tested have very little effect. It can be concluded that beach sand has potential to remove Zn(II) ions from aqueous solutions at very low concentrations and for the treatment of industrial effluent carrying Zn(II) ions. (c) 2007 Elsevier B. V . All rights reserved.

Keywords: Beach Sand, Zn(II) Ions, Sorption, Sorption Isotherms, Kinetics, Thermodynamics, Haro River Sand, Waste Material, Fly-Ash, Adsorption, Sorption, Zinc

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Full Text: [2008\Sep Pur Tec61, 229.pdf](2008/Sep%20Pur%20Tec61,%20229.pdf)

Abstract: Biosorption, as a cost-effective technology for the removal of soluble heavy metals and organics from aqueous solutions, has been extensively studied, and most biosorption research mainly focused on the process isotherms, kinetics and thermodynamics. Thus, this paper attempted to offer a better understating of representative biosorption isotherms, kinetics and thermodynamics with special focuses on theoretical approaches for derivation of combined Langmuir-Freundlich isotherm as well as the pseudo-first- and second-order kinetic equations and general rate law equation for biosorption. Meanwhile, some potential problems encountered in biosorption research were also discussed. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Aerobic Granular Sludge, Aqueous Solutions, Aqueous-Solutions, Biosorption, Biosorption Isotherms, Cephalosporium-Aphidicola, Elovich Equation, Equilibrium, Heavy Metals, Heavy-Metals, Isotherm, Isotherms, Kinetic, Kinetic Equations, Kinetics, Kinetics and Thermodynamics, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Law, Metals, Nickel(II) Ions, Potential, Rate Law, Removal, Research, Rhizopus-Arrhizus, Rights, Second Order, Second-Order, Solute Adsorption, Technology, Thermodynamics, Waste Biomass

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Full Text: [2008\Sep Pur Tec61, 348.pdf](2008/Sep%20Pur%20Tec61,%20348.pdf)

Abstract: A magnetic chelating resin with iminodiacetate functionality was prepared and investigated. This resin showed a powerful uptake behavior towards Pb(II), Cd(II), Zn(II), Ca(II) and Mg(II). Kinetic and thermodynamic characteristics of uptake process were evaluated. The uptake values obtained are comparable to that of commercial resin with the same functionality (Lewatit TP-207) but with faster kinetics. A correlation was found between the affinity of the resin towards the investigated metal ions and the values of stability constants of their complex formation. The regeneration of the resin was carried out using 0.2 M EDTA with efficiency over 96%. Recovery of Pb(II) (as an example) from aqueous solutions using column technique was carried out. The total adsorption capacity (N-o) value obtained from bed depth service time (BDST) model was found to be comparable with the experimental value of q(s). The values of critical bed height (Z(o)) and rate constant of adsorption (K-a) were found to be 0.583 cm and 41.9 L/(mol min). (C) 2007 Published by Elsevier B.V.

Keywords: Iminodiacetate Resin, Magnetic Resins, Thermodynamics, Kinetics, Regeneration, Ion-Exchange-Resins, Glycidyl Methacrylate, Selective Separation, Uptake Behavior, Adsorption, Amine, Chitosan, Equilibrium, Copper(II), Mercaptan

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Full Text: [2008\Sep Pur Tec63, 249.pdf](2008/Sep%20Pur%20Tec63,%20249.pdf)

Keywords: Solid/Solution Interfaces, Solute Adsorption, Models, Sorption, Ions

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Full Text: [2008\Sep Pur Tec63, 517.pdf](2008/Sep%20Pur%20Tec63,%20517.pdf)

Abstract: The removal of Cd(II) and Cu(II) ions from aqueous solutions was studied by sorption onto microcapsules prepared by copolymerizing ethylene glycol dimethacrylate (EGDMA) and styrene (ST). The microcapsules were prepared by an in situ radical polymerization method by adding the extractant compound, 2-ethylhexyl phosphonic acid mono-2-ethylhexyl ester, and the monomers to the continuous aqueous phase. The extractant was immobilized within the microcapsules (MCs) which presented a spherical shape with rough surface. High productions of MCs with an important retention of extractant were achieved. Microcapsules constituted by a copolymer of 65% EGDMA and 35% ST presented best capacity of sorption of both metals. These MCs presented sufficient degree of cross-linking and a suitable balance of hydrophilic-hydrophobic character. The experimental data from chemisorption of metals onto the microcapsules fitted well the applied pseudo-second-order kinetics model. The alkylphosphonic extractant presented a higher rate constant and a higher equilibrium sorption capacity for Cd(II) than for Cu(II) at the pH used in this study.

Keywords: Adsorption, Alkylphosphonic Extractant, Aqueous Phase, Aqueous Solutions, Capacity, Cd(II), Chemisorption, Copolymer, Copolymerization, Crosslinking, Cu(II), Cu(II) Ions, Data, Equilibrium, Ethylene Glycol, Experimental, Immobilized, in Situ, Kinetics, Kinetics Model, Metal, Metal Ions, Metals, Microcapsules, Model, pH, Polymerization, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rate Constant, Removal, Retention, Solutions, Sorption, Sorption Capacity, Styrene, Surface, Wastewater Treatment

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Full Text: [2008\Sep Pur Tec63, 577.pdf](2008/Sep%20Pur%20Tec63,%20577.pdf)

Abstract: Bio sorption of lead (Pb) from aqueous solution using citrus peels can provide an efficient and cost-effective solution for lead removal from industrial wastewaters. These peels contain the biopolymer pectin that has a strong affinity for metal ions. A better understanding of the chemistry behind these interactions can help in the preparation of commercial biosorbents using waste citrus peels. This study was conducted in order to obtain mechanistic information about Pb binding by low and highly methoxylated citrus pectins. Potentiometric titrations revealed that carboxyl groups are important contributors to negative charge of these biopolymers, which was further confirmed by a pH variability study. Pb binding by both low- and high-methoxylated pectins follows second-order kinetics, suggesting that each divalent metal ion binds to two monoprotic functional groups. Fourier transform infrared (FTIR) spectrometric results confirm that carboxylic acid groups are active participants in Pb binding by citrus pectin. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Aqueous Solution, Binding, Bio-Sorption, Biopolymers, Biosorbents, Biosorption, Biosorption Mechanism, Carboxylic, Charge, Chemistry, Citrus Pectin, Citrus Peels, Cost-Effective, Divalent Metal-Ions, Esterification, FTIR, FTIR Spectrometry, Functional Groups, Heavy-Metals, Hg2+ Adsorption, Information, Infrared, Ions, Kinetics, Lead, Lead Removal, Mechanism, Metal, Metal Ions, Nov, Orange, Pb, Pectin, Peels, pH, Potentiometric Titration, Preparation, Removal, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Sorption, Transform Infrared-Spectroscopy, Understanding, Variability, Waste, Wastewaters, Water

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Full Text: [2009\Sep Pur Tec67, 194.pdf](2009/Sep%20Pur%20Tec67,%20194.pdf)

Abstract: In this research, the removal of two phenols (4-nitrophenol and phenol) from aqueous solution was investigated using MgAl-mixed oxide. This oxide was prepared by calcining crystalline MgAl-CO3-layered double hydroxide (LDH) at 500°C for 4 h. we found that it takes 10-12 h for adsorption of 4-nitrophenol to reach the equilibrium at room temperature while the equilibrium time is 20-25 h for phenol adsorption. The kinetic process of 4-nitrophenol adsorption seemingly follows the first-order reaction but phenol is adsorbed in a pseudo-second-order model. We also noted that the maximum adsorption amount of 4-nitrophenol by fitted three-parameter Langmuir-Freundlich isotherm is 367.8 mg/g, much higher than that of phenol (46.9 mg/g). The differences in the adsorption kinetics and dynamics have been related to the adsorption mechanism and adsorbate-adsorbent interactions. The reconstruction of MgAl-mixed oxide in aqueous solution incorporates 4-nitrophenolate into the interlayer. However, it is difficult to intercalate phenolate due to its weaker affinity for LDH in comparison with OH-. In addition, adsorption of MgAl-mixed oxide for 4-nitrophenol and phenol is slightly affected by the initial pH, but considerably facilitated by increasing the adsorption temperature. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solutions, Delivery, Hydrotalcite-Like Compounds, Isotherm, Kinetics, Layered Double Hydroxide (LDH), Oxidation, pH, Phenols, Pollutants, Product, Reconstruction, Removal, Water

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Full Text: [2009\Sep Pur Tec67, 251.pdf](2009/Sep%20Pur%20Tec67,%20251.pdf)

Abstract: Novel nanocomposite adsorbent materials were synthesized by dehydroxylation condensation of tetraethoxy silane (TEOS) in the presence of guar gum-graft-poly(acrylamide) using ammonium hydroxide as catalyst and ethanol as co-solvent. The ratio of H2O:TEOS:EtOH was varied at fixed concentration of copolymer and catalyst to obtain a series of materials which were evaluated for their ability to bind cadmium from the aqueous solution in a preliminary investigation. The most efficient adsorbent material thus obtained was calcinated (in air) in stages up to 1100°C where the binding ability of the material could be further tailored and materials of different performances were obtained. The material calcined at 600°C was found most efficient and its adsorbent behavior was studied in detail taking Cd(II) as representative ion. The chemical, structural and textural characteristics of the material were determined by FTIR, XRD, TGA-DTA, PL, SEM and EDAX analysis. BET (Brunauer-Emmett-Teller) specific surface area and pore structure of the adsorbent was also examined. The adsorption behavior of the bioadsorbent was investigated by performing both kinetics and equilibrium studies in batch conditions. The adsorption conditions for the adsorbent were optimized by varying several experimental parameters i.e. contact time, initial cadmium concentration, temperature, adsorbent dose, electrolyte amount and pH of the solution. The adsorption showed pseudo-second-order kinetics with a rate constant of 2.85×10-3, 1.88×10-4 and 2.05×10-4 g mg-1 min-1 at 500,700 and 900 mg L-1 initial Cd(II) concentrations, respectively. The adsorption data were modeled using both the Langmuir and Freundlich isotherms. The data fitted better to Langmuir isotherm indicating unilayer adsorption. The maximum adsorption capacity (*q*max) for the composite was found to be significantly very high (2000 mg g-1). The thermodynamic study revealed the endothermic and spontaneous nature of the sorption. The composite exhibited very high reusability for more than six cycles. Thereafter its efficiency slowly declined and reached 56% by the 10th cycle. The porous composite sorbent was easy to prepare and was also found to be highly stable and photoluminescent making this biosorption approach quite attractive from the industrial point of view. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Adsorption Behavior, Adsorption Capacity, Air, Ammonium, Amorphous Silica, Analysis, Approach, Aqueous Solution, Aqueous Solutions, Batch, Behavior, Bet, Binding, Biosorption, Cadmium, Calcined, Capacity, Catalyst, Cd(II), Cd(II) Adsorption, Characteristics, Chemical, Coir Pith, Composite, Concentration, Copolymer, Data, Dehydroxylation, EDAX, Efficiency, Endothermic, Equilibrium, Equilibrium Studies, Ethanol, Experimental, Freundlich, FTIR, Guar-Graft-Poly(Acrylamide)-Silica, Heavy-Metal Ions, Investigation, Isotherm, Isotherms, Kinetics, L1, Langmuir, Langmuir And Freundlich Isotherms, Langmuir Isotherm, Modified, Nanocomposite, Nanocomposites, pH, Photoluminescence, Polyacrylamide, Porous Silicon, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rate Constant, Removal, Rights, Saw Dust, SEM, Solution, Solutions, Sorbent, Sorption, Specific Surface, Specific Surface Area, Structure, Surface, Surface Area, Temperature, TEOS, Thermodynamic, Thermodynamics, Water, XRD

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Full Text: [2009\Sep Pur Tec67, 312.pdf](2009/Sep%20Pur%20Tec67,%20312.pdf)

Abstract: A hydrothermal treatment combined with metal doping was employed to prepare highly porous Co-doped TiO2 nanotubes (TNTs) for enhancement of adsorption and visible-light-driven photocatalysis capabilities of basic violet 10 (BV10) from liquid phase. The specific surface area of prepared TNTs can reach the maximal value of similar to 379 m2/g. These tubes are hollow scrolls with a typical outer diameter of about 10-15 nm, inner diameter 5-10 nm and length of several micrometers. The anatase-type of TNTs has an average Co-dopant concentration of 5×1020 ions/cm3, determined by an electron dispersive X-ray spectrometer. The adsorptive surface coverage on TNTs was found to be ca. 7.61-7.63%, showing a low affinity between BV10 molecules and TNTs. A pseudo-second-order reaction model was used to fit with the experimental data of adsorption and photocatalystic kinetic curves. The adsorption rate constant has one order higher than the photocatalytic rate constant, reflecting that the photocatalysis of the basic dye is the rate-determining step during the adsorption/photocatalysis process. These novel Co-doped TNTs are believed to be a promising candidate in a variety of photocatalysis applications because of the combination effect of a high porosity with a photocatalysis under visible illumination. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Rate, Basic Dye, Basic-Dyes, Carbons, Cobalt Doping, Combination Effect, Concentration, Coverage, Data, Degradation, Dye, Experimental, Hydrothermal Synthesis, Hydrothermal Treatment, Ion-Implantation, Kinetic, Kinetics, Length, Liquid, MCM-41, Metal, Model, Nanoparticles, Nanotubes, Organic, Photocatalysis, Photocatalytic, Porosity, Pseudo Second Order, Pseudo-Second-Order, Rate Constant, Rate-Determining Step, Removal, Rights, Solar-Cells, Specific Surface, Specific Surface Area, Surface, Surface Area, Synthesis, TiO2, TiO2 Nanotubes, Titania Nanotubes, Treatment, Value, Visible-Light Photocatalysis,Adsorption, Waste-Water, X-Ray

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Full Text: [2011\Sep Pur Tec78, 55.pdf](2011/Sep%20Pur%20Tec78,%2055.pdf)

Abstract: Adsorption by volcanic rocks is investigated as a possible alternative to the conventional method of Cr(VI) removal from polluted waters. In this work, adsorption of Cr(VI) onto pumice (VPum) and scoria (VSco) has been studied by using a batch method at room temperature. The following factors affecting sorption of Cr(VI) were investigated: solution pH, contact time, type and size of adsorbents, adsorbent dose and initial metal ion concentration. The maximum adsorption yield, 77% for VSco and 80% for VPum, was obtained at low pH of about 2. The applicability of the Langmuir as well as Freundlich adsorption isotherms for the present system is tested. The batch sorption kinetics has been mathematically described using the Lagergren pseudo-first order, pseudo-second order equations and equations for intra-particle and liquid film diffusion. For both VPum and VSco, the entire kinetic data fitted well with pseudo-second-order reaction rate model. In the case of VSco, the rate constant was the highest (338×10-3 kg mg-1 h-1) and the VPum gave the lowest (7×10-3 kg mg-1 h-1). The experimental results inferred that electrostatic attraction and surface complexation are the major adsorption mechanisms for binding Cr(VI) ions to the macro and micro-vesicular volcanic rocks. The two volcanic rocks tested have potential for an inexpensive and suitable method for removal of Cr(VI) from polluted waters. (c) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Cr(VI), Cr(VI) Removal, Ethiopia, Freundlich, Heavy-Metals, Hexavalent Chromium, Isotherms, Kinetic, Kinetics, Langmuir, Low-Cost Adsorbents, pH, Pumice, Pumice, Removal, Scoria, Sorption, Trace-Metals, Waste-Water

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Full Text: [2011\Sep Pur Tec81, 184.pdf](2011/Sep%20Pur%20Tec81,%20184.pdf)

Abstract: Fibric peat was modified with hexadecyltrimethylammonium bromide (HTAB) and its efficiency as a biosorbent for the removal of endocrine disrupting chemical-bisphenol A (BPA) was investigated. The HTAB-modified peat displayed a faster initial BPA sorption and substantially higher capacity than the unmodified peat over a wide concentration range. Kinetic study showed that the sorption followed the pseudo-second-order kinetic model. The maximum sorption capacity of 31.40 mg g-1 was obtained at initial concentration of 45 mg L-1. The BPA sorption to HTAB-modified peat was better described by Freundlich isotherm, while Langmuir isotherm fits better to the BPA sorption against unmodified peat. Comparing with raw fibric peat, the HTAB-modified peat removed more BPA molecules and the desorption rate was much lower. It shows that the improved hydrophobic interactions are the dominant mechanism and the chemical modification of the peat surface greatly enhanced the sorption capacity toward organic compound dissolved in water. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorbents, Adsorption, Bisphenol A, Drinking-Water, Dye Removal, Isotherm, Kinetic, Langmuir, Liquid-Chromatography, Membrane, Modification, Nonylphenol, Peat, Quaternary Ammonium, Removal, Sorption, Waste-Water, Water Treatment

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Full Text: [2011\Sep Pur Tec82, 93.pdf](2011/Sep%20Pur%20Tec82,%2093.pdf)

Abstract: Novel composite adsorbents for As(V) removal from aqueous solution were synthesized by successfully incorporating α-MnO2 nanorods and γ-Fe2O3 nanoparticles onto ball-milled expanded perlite carrier material. The composite adsorbents were characterized using Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), Powder X-ray diffraction (XRD) and Brunauer-Elmet-Teller nitrogen adsorption (BET-N2 adsorption). The BET surface area of ball-milled expanded perlite increased by 4.0 and 7.1 times after the incorporation of γ-Fe2O3 and alpha-MnO2 nanomaterials. The adsorption capacity for As(V) was found to be highly pH dependent and the adsorption kinetics followed the pseudo-second-order kinetic model. The Langmuir isotherm was found to be the best model to describe the adsorption of As(V) on both composites and the adsorption capacity was 4.64 and 7.09 mg g-1 for γ-Fe2O3 and α-MnO2 containing adsorbents as compared to 0.0025 mg g-1 for perlite alone, confirming that these composites retain the constituent nanomaterial properties while being macroscopic particles suitable for arsenic removal in water treatment technology. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, α-MnO2 Nanorods, Aqueous-Solution, Arsenate Adsorption, Arsenic Removal, Ball-Milling, BET, Expanded Perlite, γ-Fe2O3 Nanoparticles, Ions, Isotherm, Kinetics, Langmuir, Manganese, Nanoparticles, Perlite, pH, Preparation, Sorption, Water, Water Treatment

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Full Text: [2011\Sep Pur Tec83, 196.pdf](2011/Sep%20Pur%20Tec83,%20196.pdf)

Abstract: In this study, the sorption and desorption of U(VI) from contaminated groundwater by nanoporous and non-nanoporous alumina were investigated under ambient conditions. The nanoporous and non-nanoporous alumina were characterized by XRD, specific surface area analysis, TEM and potentiometric acid-base titration. The nanoporous alumina exhibited high sorption capacity, large specific surface area, high surface acidity constants, low difference of surface acidity constants and high pH(PNZC) (point of net zero charge) due to the nanoporous effect. The worm-like shape nanoporous alumina was transferred into the floc-like shape gibbsite after the sorption in terms of TEM images. Sorption kinetics and sorption isotherms of U(VI) on both nanoporous and non-nanoporous alumina can be interpreted by pseudo-second order kinetic model and the Langmuir model, respectively. The sorption of U(VI) on nanoporous alumina is strongly dependent on pH and independent of ionic strength, whereas U(VI) sorption on non-nanoporous alumina is dependent on pH and ionic strength. The sorption mechanism is assumed to be mainly inner-sphere surface complexation for nanoporous alumina and outer-sphere surface complexation for non-nanoporous alumina. Approximately 100% of U(VI) was desorbed from non-nanoporous alumina while only similar to 5% of U(VI) was extracted from nanoporous alumina when the concentration of NaHCO3 was increased to 0.01 M in terms of sequential desorption experiments. The nanoporous alumina can be used as an efficient material for in situ immobilization of U(VI) from contaminated groundwater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Drinking-Water, Equilibria, Groundwater, Hematite, Kinetic, Kinetics, Langmuir, Microbial Reduction, Nanoporous Alumina, pH, Removal, Site-Binding Model, Sorption, Sorption Kinetics, Transitions, U(VI), Uranium, Water Interface

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? Bhattacharyya, D., Jumawan, A.B. and Grieves, R.B. (1979), Separation of toxic heavy metals by sulfide precipitation. *Separation Science and Technology*, **14** (5), 441-452.

Full Text: [1960-80\Sep Sci Tec14, 441.pdf](1960-80/Sep%20Sci%20Tec14,%20441.pdf)

Abstract: Sulfide precipitation with Na2S is found to be highly effective to obtain a high degree of separation of heavy metal cations (Cd, Zn, Cu, and Pb) and of the oxyanions of arsenic and selenium from complex wastewaters. The metal separation characteristics are evaluated with a dilute synthetic mixture and with an actual copper smelting plant wastewater. The overall separation of arsenic and other heavy metals and precipitate settling rates are optimum at sulfide dosages about 60% of the theoretical values and at a final pH greater than 8.0. The removals of Cd, Zn, and Cu from the actual wastewaters are greater than 99%, and As and Se removals are 98 and >92%, respectively. Cd, Cu, and Zn concentrations in the range of 0.05 to 0.1 mg/1 can be achieved with sulfide precipitation. The metal separations and settling rates obtained with conventional hydroxide precipitation (lime) are considerably lower than those obtained with sulfide precipitation.

? Varshney, K.G., Sharma, U., Rani, S. and Premadas, A. (1982), Cation-exchange study on a crystalline and thermally stable phase of antimony silicate. effect of irradiation on ion-exchange behavior and separation of Cd(II) from Zn(II) and Mn(II) and of Mg(II) from Ba(II), Ca(II), and Sr(II). *Separation Science and Technology*, **17** (13-14), 1527-1543.

Full Text: [1982\Sep Sci Tec17, 1527.pdf](1982/Sep%20Sci%20Tec17,%201527.pdf)

Abstract: A systematic ion-exchange study has been performed on antimony silicate, which includes its ion-exchange capacity, elution behavior, pH titrations, and distribution coeflicients of common metal ions. The Kd values for alkali metals vary with the pH of the solution and the material is found to be highly selective for Rb(I) at pH values greater than 1. On the basis of distribution studies, the separation of Cd(II) from Zn(II) and Mn(II) has been achieved. Similarly, Mg(II) has been separated from Ba(II), Ca(II), and Sr(II) to illustrate its utility. Antimony silicate is very stable both thermally and chemically and possesses reproducible ion-exchange properties, also, the effect of irradiation on the ion-exchange behavior is negligible. A tentative formula of the material has also been proposed based on chemical, infrared, and thermogravimetric analysis studies, The x-ray studies reveal that the exchanger is crystalline with a d-value of 6.09Å.

Yenkie, M.K.N. and Natarajan, G.S. (1991), Adsorption equilibrium studies of some aqueous aromatic pollutants on granular activated carbon samples. *Separation Science and Technology*, **26** (5), 661-674.

Full Text: [1991\Sep Sci Tec26, 661.pdf](1991/Sep%20Sci%20Tec26,%20661.pdf)

Abstract: Adsorption equilibrium studies of some aromatic organic pollutants in water withsome commercially available standard grades of granular activated carbons havebeen carried out at 35°C. The adsorption equilibrium data for adsorbatessuch as phenol, aniline, benzoic acid, o-cresol, and p-methoxyphenol on six gradesof granular activated carbons were analyzed for their adherence to Freundlich orLangmuir adsorption isotherms, and the results are discussed.

? Kawakita, T., Matsuishi, T. and Koga, Y. (1991), Optimization of lysine adsorption process using strong cation- exchange resin. *Separation Science and Technology*, **26** (6), 869-883.

Full Text: [1991\Sep Sci Tec26, 869.pdf](1991/Sep%20Sci%20Tec26,%20869.pdf)

Abstract: A simplified method is proposed for determining the optimum conditions of multicolumn adsorption of lysine from a lysine fermentation broth, in which the resin columns periodically move countercurrent to a continuous broth flow. Experimental data on dynamic isotherms in the fixed-bed column are required for the calculations. The recurrence equation involved was solved on a personal computer. Based on this model, the optimum operation conditions of lysine adsorption were determined in order to minimize the production cost of lysine recovery from lysine fermentation broth.

Keywords: Adsorption, Column, Fermentation, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Bed Column, Isotherms, Model, Recovery

? Fujita, I., Nagano, Y., Haratake, M., Harada, K., Nakayama, M. and Sugii, A. (1991), Adsorption of nonionic surfactants on chemically modified styrene divinylbenzene copolymers. *Separation Science and Technology*, **26** (10-11), 1395-1402.

Full Text: [1991\Sep Sci Tec26, 1395.pdf](1991/Sep%20Sci%20Tec26,%201395.pdf)

Abstract: Two series of resins with both polar and nonpolar regions were synthesized by the introduction of alpha-oxoalkyl and alpha-hydroxyalkyl groups to a porous low crosslinked styrene-divinylbenzene (7.5% divinylbenzene). These resins showed higher adsorption capacity for polyoxvethylene-type nonionic surfactants than did the starting resin. Resins with shorter alkyl chains are particularly more effective than those with longer chains. It is suggested that the polar groups on the modified resins contribute to the increase in adsorption of the surfactants.

Keywords: Adsorption, Adsorption Capacity, Capacity, Modified, Porous, Resins, Surfactants

Saleem, M., Afzal, M., Qadeer, R. and Hanif, J. (1992), Selective adsorption of uranium on activated-charcoal from electrolytic aqueous solutions. *Separation Science and Technology*, **27** (2), 239-253.

Full Text: [1992\Sep Sci Tec27, 239.pdf](1992/Sep%20Sci%20Tec27,%20239.pdf)

Abstract: Adsorption of uranium on activated charcoal has been studied as a function of shaking time, amount of adsorbent, pH, concentration of adsorbate, and temperature. Uranium adsorption obeys the Langmuir isotherm. DELTA-H-degrees and DELTA-S-degrees were calculated from the slope and intercept of plots of ln K(D) vs 1/T. The influence of different anions and cations on uranium adsorption has been examined. The adsorption of other metal ions on activated charcoal has been studied under specified conditions to check its selectivity, consequently, uranium was removed from Cs, Ba, Zn, and Co. More than 98% adsorbed uranium on activated charcoal can be recovered with 65 mL of 3 M HNO3 solution. A wavelength dispersive x-ray fluorescence spectrometer was used for measuring uranium concentration.

Keywords: Zirconium

? Garciadelgado, R.A., Cotoruelominguez, L.M. and Rodriguez, J.J. (1992), Equilibrium study of single-solute adsorption of anionic surfactants with polymeric XAD resins. *Separation Science and Technology*, **27** (7), 975-987.

Full Text: [1992\Sep Sci Tec27, 975.pdf](1992/Sep%20Sci%20Tec27,%20975.pdf)

Abstract: Equilibrium data for the adsorption of sodium lauryl sulfate (SLS) and sodium dodecylbenzene sulfonate (SDBS) from aqueous solutions by Amberlite XAD-4 and XAD-7 polymeric resins at temperatures in the 10-40°C range have been obtained. The specific surface area of the resins plays a major role in adsorption, and thus the best results have been obtained with XAD-4 resin. A higher adsorption of SDBS over SLS was also observed. Several adsorption isotherm models have been used to fit the experimental data. The best results have been obtained with the Redlich-Peterson and Langmuir-Freundlich equations. Estimations of the isosteric heat of adsorption, free energy, and entropy of adsorption are also reported.

KeyWords: Isotherms

? Bhandari, V.M., Juvekar, V.A. and Patwardhan, S.R. (1992), Modified Shrinking Core Model for Reversible Sorption on Ion-Exchange Resins. *Separation Science and Technology*, **27** (8-9), 1043-1064.

Full Text: [1992\Sep Sci Tec27, 1043.pdf](1992/Sep%20Sci%20Tec27,%201043.pdf)

Abstract: A modified shrinking core model is proposed to correlate dynamics of acid sorption on weak base ion-exchange resins in free base form. The model considers reversibility of the sorption process which is ignored in the conventional shrinking core model. The model is easy to apply and is shown to yield results which are in agreement with a computationally intensive rigorous model. The model is successfully verified using the experimental data on sorption of strong acids (HCI and HNO3) on weak base resins (Dowex WGR-2 and Amberlite IRA-93).

Keywords: Acid Sorption, Acids, Dynamics, HNO3, Ion Exchange, Kinetics, Model, Modeling, Modified, Resins, Shrinking Core Model, Sorption, Weak Base Resin, Yield

Rajaković, L.V. (1992), The sorption of arsenic onto activated carbon impregnated with metallic silver and copper. *Separation Science and Technology*, **27** (11), 1423-1433.

Full Text: [1992\Sep Sci Tec27, 1423.pdf](1992/Sep%20Sci%20Tec27,%201423.pdf)

Abstract: The adsorption of arsenic species in aqueous solutions onto activated carbon with and without chemical impregnation has been studied. The ability of activated carbon to adsorb arsenic depends on the arsenic oxidation state, the pH of the water, and the activity of the metal used for the activated carbon impregnation. The results of the investigations have shown that physical adsorption is effective only for the arsenic(V) species in water. Activated carbon adsorbs arsenic(V) with a saturation adsorption capacity of 0.27 mmol/g. The chemisorption process is effective for both arsenic species. By impregnation of activated carbon by copper, the sorption process for the arsenic(III) species is significantly improved. The saturation adsorption capacity of the activated carbon impregnated by copper is 0.41 and 0.23 mmol/g for the arsenic(III) and arsenic(V) species, respectively. The pH values of the water are important for both sorption processes because of the change in the ionic forms of both arsenic species. The optimal pH range is between 4 and 9, which is a consequence of the apparent affinity between the carbon surface and arsenic species H3AsO3 and H2AsO4-that are predominant at this pH in water. Equilibrium isotherm analyses were undertaken using Langmuir and Freundlich equations.

Keywords: Adsorption, Activated Carbon, Impregnation, Water Pollution, Equilibrium Isotherms, Arsenic, Copper, Removal, Adsorption, Idaho

Hasany, S.M. and Saeed, M.M. (1992), A kinetic and thermodynamic study of silver sorption onto manganese-dioxide from acid-solutions. *Separation Science and Technology*, **27** (13), 1789-1800.

Full Text: [1992\Sep Sci Tec27, 1789.pdf](1992/Sep%20Sci%20Tec27,%201789.pdf)

Abstract: The batch kinetics of silver sorption at the tracer level onto manganese dioxide along with the thermodynamic parameters from dilute nitric and perchloric acid solutions are described. The values of DELTA-H, DELTA-S, and DELTA-G found from both acid solutions are similar. The sorption equilibrium constant, K(C), has been calculated at different temperatures between 288 and 308 K. Tests of different isotherms have shown that the sorption data fit very well to the Freundlich and Dubinin-Radushkevich (D-R) models at different temperatures. The thermodynamic data indicate the endothermic nature of silver sorption onto the oxide. The sorption capacity in the 0.23-0.77 mmol/g range and a mean free energy of sorption of about 11.5-15.4 kJ/mol have been found by using the D-R approach. The values of B and the correlation factor (r) have been determined by using the D-R isotherm. These values are comparable with those reported earlier for other sorption systems.

Keywords: Kinetics, Thermodynamics, Silver, Sorption, Manganese Dioxide, Acid Solutions, Adsorption, Microamounts

? Reed, B.E. and Matsumoto, M.R. (1993), Modeling cadmium adsorption by activated carbon using the Langmuir and Freundlich isotherm expressions. *Separation Science and Technology*, **28** (13-14), 2179-2195.

Full Text: [1993\Sep Sci Tec28, 2179.pdf](1993/Sep%20Sci%20Tec28,%202179.pdf)

Abstract: Cadmium adsorption isotherms were conducted using two commercially available powdered activated carbons (PACs). Isotherms were conducted at several pH values and metal and carbon concentrations. Both PACs removed significant amounts of cadmium, and removal was a strong function of solution pH: increasing the solution pH increased cadmium adsorption. Adsorption data at a specific pH were successfully modeled using both the Langmuir and Freundlich isotherms. Adsorption and surface precipitation were hypothesized to be the operative removal mechanisms. Cadmium removal is strongly related to the carbon’s pHZPC, acid-base characteristics, and surface charge-pH relationship, Surface area, an important adsorption parameter for organic adsorbates, does not appear to influence metal removal strongly.

Keywords: Surface-Acidity, Heavy-Metals

Reed, B.E. and Cline, S.R. (1994), Retention and release of lead by a very fine sandy loam. I. Isotherm modeling. *Separation Science and Technology*, **29** (12), 1529-1551.

Full Text: [1994\Sep Sci Tec29, 1529.pdf](1994/Sep%20Sci%20Tec29,%201529.pdf)

Abstract: The retention of lead by a very fine sandy loam was investigated. Aqueous lead concentrations between 10 and 1000 mg/L and soil concentrations ranging from 10 to 167 g/L were used. Lead retention by the soil was a strong function of pH. The width of the pH-adsorption edge decreased with increasing lead concentration. Experimental results were modeled using the Langmuir, Freundlich and BET isotherms. Only the Langmuir and Freundlich isotherms successfully represented the experimental results. The role of surface precipitation was assumed to be small because of the failure of the BET isotherm to adequately predict metal retention. The Freundlich isotherm provided the best fit because a maximum surface concentration was usually not observed. Langmuir and Freundlich isotherms parameters varied in a way that suggested that the average binding energy and the distribution of bond strengths increased with increasing pH. The isotherm expressions determined in this study can be used as source-sink terms in the generalized mass transport model.

Keywords: Heavy-Metals, Adsorption, Soils, Extraction, Interface, Sorption, Cadmium, Oxides, Ions, Cd

? Muraleedharan, T.R., Venkobachar, C. and Leela, I. (1994), Investigations of fungal fruiting bodies as biosorbents for the removal of heavy-metals from industrial processing streams. *Separation Science and Technology*, **29** (14), 1893-1903.

Full Text: [1994\Sep Sci Tec29, 1893.pdf](1994/Sep%20Sci%20Tec29,%201893.pdf)

Abstract: The revival of interest in biotechnology has fueled research in many sectors of environmental biotechnology. The present paper describes research utilizing adsorbents prepared from wood-rotting mushrooms growing wild in tropical forests. Nine species of mushrooms were screened using copper(II) as the model adsorbate. While may species showed excellent potential, comparable to biosorbents reported in literature, Ganodernma lucidum emerged as the best biosorbent. This biosorbent was further developed for use in a packed-bed bioreactor for treatment of rare earth processing effluents. Electron paramagnetic studies confirmed that adsorption is by chemical binding to the biosorbent.

Keywords: Biosorption, Wood-Rotting Mushrooms, Rare Earth Industry, Ganoderma Lucidum, Electron Paramagnetic Resonance, Biomass, Ions

Saeed, M.M., Rusheed, A., Ahmed, N. and Tölgyessy, J. (1994), Extraction and adsorption behavior of Co(II) on HTTA-impregnated polyurethane foam. *Separation Science and Technology*, **29** (16), 2143-2160.

Full Text: [1994\Sep Sci Tec29, 2143.pdf](1994/Sep%20Sci%20Tec29,%202143.pdf)

Abstract: The batch extraction of Co(II) from aqueous solutions with open cell polyether-type HTTA-loaded polyurethane (PU) foam has been studied using a radiotracer technique. The effect of pH, shaking time, and loading capacity has been investigated. The membrane properties of loaded PU foam sorbent offer unique advantage of adsorption. The fundamental studies of adsorption show that the classical Freundlich and Langmuir isotherms are followed in the entire concentration range of a 10-5 to 10-2 M solution of cobalt. The sorption mean free energy from the Dubinin-Radushkevich isotherm is found to be 13.8 kJ.mol-1 and the loading capacity 4.44 mg.g-1, suggesting that the ion-exchange or chemisorption mechanism operates. The kinetic parameters of adsorption also support a chemisorption mechanism and the first-order rate law. The rate constants and activation energies of sorption and desorption have been evaluated. The thermodynamic function of adsorption of DELTAH, DELTAS, DELTAG, and equilibrium constant K(C) have been calculated. The process of adsorption is established to be endothermic and chemisorption, stabilized through thermodynamic functions.

Keywords: Activation, Adsorption, Aqueous Solutions, Batch, Capacity, Chemisorption, Co(II), Cobalt, Concentration, Delta, Desorption, Endothermic, Energy, Equilibrium, Extraction, First Order, Foam, Freundlich, Function, Functions, Ion Exchange, Ion-Exchange, Ionexchange, Isotherm, Isotherms, Kinetic, Kinetic Parameters, Langmuir, Langmuir Isotherms, Law, Loading, Mechanism, Membrane, Open, pH, Polyurethane, Pre-Concentration Methods, PU, Radiotracer, Radiotracer Technique, Rate Constants, Rate Law, Ray-Fluorescence Spectrometry, Solution, Solutions, Sorbent, Sorption, Support, Thermodynamic, Thermodynamic Functions, Trace-Elements, Water

Reed, B.E. (1995), Identification of removal mechanisms for lead in granular activated carbon (GAC) columns. *Separation Science and Technology*, **30** (1), 101-116.

Full Text: [1995\Sep Sci Tec30, 101.pdf](1995/Sep%20Sci%20Tec30,%20101.pdf)

Abstract: In an earlier study the removal of lead by a granular activated carbon (GAC) column was increased by over 600% when the carbon [Hydrodarco 4000 (HD4000), Norit Americas, Inc.] was contacted with a 0.1 N HNO3-0.1 N NaOH rinse. Hypothesized removal mechanisms were adsorption, surface preceipitation and pore precipitation. In this work a series of experiments were conducted on samples of the virgin and acid-base rinsed carbon to determine their acid-base behavior, pHzpc and Pb removal ability. If adsorption was a dominant removal mechanism, then significant differences in these parameters for the virgin and acid-base rinsed carbons would be expected. The strong acid-base rinse did not significantly alter the acid-base behavior, pHzpc, or the Pb removal ability compared to virgin HD4000. Thus, it appears that the dramatic increase in metal removal by the regenerated GAC columns was not caused by an increase in the number or type of adsorption sites but was due to the precipitation of Pb on the carbon surface or in the carbon pore liquid. Future research efforts will focus on the modeling of Pb removal in GAC columns using precipitation as the primary removal mechanism.

Keywords: Adsorption

Van Deventer, J.S.J. and Van Der Merwe, P.F. (1995), Kinetic model for the decomposition of cyanide during the elution of gold from activated carbon. *Separation Science and Technology*, **30** (6), 883-898.

Full Text: [1995\Sep Sci Tec30, 883.pdf](1995/Sep%20Sci%20Tec30,%20883.pdf)

Abstract: Free cyanide is usually present during the elution of gold cyanide from activated carbon. The decomposition of cyanide is important not only in the extraction of gold but also for environmental reasons. Previous studies have indicated that competitive adsorption of cyanide with aurocyanide plays a minor role at the elevated temperatures used in industry. A more important effect of cyanide is its decomposition reaction with functional groups on the carbon, the products of which passivate the surface for adsorption of aurocyanide and thereby cyanide appears to enhance the elution of aurocyanide. It was observed that the degree of passivation affects the elution of gold and the degradation/adsorption of cyanide itself. Batch tests have shown that the rate of oxidation of cyanide at low temperatures is independent of particle size and more dependent on film transfer. Based on these observations, a kinetic model was proposed for the decomposition and elution of cyanide in packed columns of activated carbon. The oxidation and hydrolysis reactions in the bulk solution, as well as in the carbon pores, were combined and described by single first-order reactions. It was found that the same kinetic parameters could be used to give satisfactory predictions of experimental data for a wide range of conditions.

Keywords: Electrochemical Destruction, Chemical Behavior, Extraction

? Kim, K.R., Lee, K.J. and Bae, J.H. (1995), Characteristics of cobalt adsorption on prepared TiO2 and Fe-Ti-O adsorbents in high-temperature water. *Separation Science and Technology*, **30** (6), 963-979.

Full Text: [1995\Sep Sci Tec30, 963.pdf](1995/Sep%20Sci%20Tec30,%20963.pdf)

Abstract: TiO2 and Fe-Ti-O adsorbents were prepared by hydrolysis of Ti(OC3H7)4 and by alkalizing an equimolar mixed solution of TiCl4 and FeCl2, followed by heat treatment of their hydroxides. Their structures were studied by x-ray diffractometry and TG-DTA. The Co2+ adsorption characteristics of the adsorbent in high temperature water were investigated in a stirred autoclave. The prepared Fe-Ti-O adsorbent was found to be a stable nonstoichiometric ferrous/ferric titanium oxide with pseudobrookite and rutile structures. The Co-Z+ adsorption capacity of the Fe-Ti-O adsorbent was determined to be larger (0.38 meg Co2+/g adsorbent at 280°C) than that of TiO2 at high temperature. The enthalpy changes (ΔH°) of about 34 and 49 kJ . mol-1 due to the adsorption of Co-Z+ on the TiO2 and Fe-Ti-O adsorbents, respectively, indicates that the adsorption is endothermic in the experimental temperature range (150-280°C). It is shown that the specific surface areas of these adsorbents are not dominant factors for Co2+ adsorption on oxides at high temperature.

Keywords: Titanium-Oxide, Removal

? Periasamy, K. and Namasivayam, C. (1995), Adsorption of Pb(II) by peanut hull carbon from aqueous solution. *Separation Science and Technology*, **30** (10), 2223-2237.

Full Text: [1995\Sep Sci Tec30, 2223.pdf](1995/Sep%20Sci%20Tec30,%202223.pdf)

Abstract: Carbon prepared from peanut hulls (PHC) has been used for the adsorption of Pb(II) over a range of initial metal ion concentrations (10-20 mg/L), agitation times (5-140 minutes), adsorbent dosages (5-100 mg/100 mt) and pH values (1.5-10.0). Adsorption of Pb(II) obeyed the Langmuir isotherm. The applicability of the Lagergren kinetic model has also been investigated. Quantitative removal of 20 mg/L Pb(II) by 0.3 g carbon per liter aqueous solution was observed in the pH range of 3.0 to 10.0. A comparative study with a coal-based commercial granular activated carbon (CAC) showed that the adsorption capacity of PHC was 18 times larger than that of CAC.

Keywords: Activated Carbon, Removal, Equilibrium, Water, Clay

? Inoue, K., Yamaguchi, T., Iwasaki, M., Ohto, K. and Yoshizuka, K. (1995), Adsorption of some platinum-group metals on some complexane types of chemically-modified chitosan. *Separation Science and Technology*, **30** (12), 2477-2489.

Full Text: [1995\Sep Sci Tec30, 2477.pdf](1995/Sep%20Sci%20Tec30,%202477.pdf)

Abstract: A few kinds of complexane types of chemically modified chitosan, i.e., monocarboxymethylated chitosan (MCM-chitosan) and IDA- and DTPA-types of chitosan (IDA- and DTPA-chitosan) were synthesized to examine the adsorption of palladium(II), platinum(IV), and iridium(III) from hydrochloric acid solution as well as the elution of palladium and platinum and compared with those by crosslinked copper(II)-complexed chitosan (crosslinked chitosan). The adsorption of palladium(II) monotonously decreased with increasing hydrochloric acid concentration with all kinds of adsorbents. The adsorption of platinum(IV) also decreased with increasing hydrochloric acid concentration with all kinds of adsorbents except for DTPA-chitosan, with which it decreased in the low concentration region and increased in the high concentration region. The adsorption of iridium(III) also decreased with increasing concentration of hydrochloric acid with all kinds of adsorbents except for IDA-chitosan, but that on DTPA-chitosan was much smaller than other adsorbents. The adsorption on IDA-chitosan increased with increasing hydrochloric acid concentration in its low concentration region, and decreased in the high concentration region, different from other adsorbents. The magnitude of adsorption capacity of each adsorbent for palladium(II) was in the order MCM-chitosan = IDA-chitosan > DTPA-chitosan > crosslinked chitosan, while that for platinum(IV) was in the order, DTPA-chitosan > MCM-chitosan = IDA-chitosan > crosslinked chitosan. The elution of loaded palladium(II)) and platinum(IV)) with hydrochloric acid solution was much improved by chemical modification, especially that of platinum(IV) which was drastically improved by using IDA- and MCM-chitosan.

Keywords: 8-Quinolinol, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Capacity, Chemical, Chemical Modification, Chemically Modified Chitosan, Chitosan, Cobalt, Concentration, Hydrochloric Acid, Ions, Modification, Modified, Oxidation, Palladium, Platinum, Solvent-Extraction

? Costa, E.T.H., Winkler-Hechenleitner, A.A. and Gómez-Pineda, E.A. (1995), Removal of cupric ions from aqueous solutions by contact with corncobs. *Separation Science and Technology*, **30** (12), 2593-2602.

Full Text: [1995\Sep Sci Tec30, 2593.pdf](1995/Sep%20Sci%20Tec30,%202593.pdf)

Abstract: The separation of cupric ions from aqueous solution by adsorption onto modified corncobs (hemicellulose-free) was studied. The adsorption process was found to take similar to 15 minutes to attain equilibrium in experiments with continuous agitation at 35°C. The process was found to be pH-dependent, with increasing adsorption as pH increases up to 6.00. There is evidence that the adsorption mechanism is an ion-exchange one involving carboxylate groups, and that two binding sites may be present at the adsorbent. The adsorption was found to fit a Langmuir isotherm, and the parameters n(S) (adsorbent capacity) and b (adsorption intensity) were calculated. The results obtained show that corncobs are an interesting adsorbent because they are available in large quantities at several places in the world at little or no cost, and they retain cupric ions rapidly. The corncobs studied also contain aliphatic and phenolic hydroxyl groups that allow for the incorporation of other functional groups and thus increase the adsorbent capacity.

Keywords: Microcrystalline Cellulose, Adsorption, Sorptions, Lignin, Wood, Skins

? Mandjiny, S., Zouboulis, A.I. and Matis, K.A. (1995), Removal of cadmium from dilute solutions by hydroxyapatite. I. Sorption studies. *Separation Science and Technology*, **30** (15), 2963-2978.

Full Text: [1995\Sep Sci Tec30, 2963.pdf](1995/Sep%20Sci%20Tec30,%202963.pdf)

Abstract: The removal of toxic metals (such as cadmium) was investigated by using hydroxyapatite, an effective inorganic sorbent, at the ultrafine particle size range. In bench-scale experiments performed batchwise, the influence of the main sorption parameters were examined (i.e., solution pH, sorbent and cadmium concentrations, and temperature) and comparison was attempted between demineralized and tap water. Typical adsorption isotherms of the Langmuir type were calculated; zeta-potential measurements of the hydroxyapatite particles and the release of calcium (during the process) were also examined and related to possible mechanisms occurring during the cadmium removal process.

Keywords: Inorganic Cation-Exchangers, Ions

Saraydin, D., Karadağ, E. and Güven, O. (1995), Adsorptions of some heavy-metal ions in aqueous-solutions by acrylamide maleic-acid hydrogels. *Separation Science and Technology*, **30** (17), 3287-3298.

Full Text: [1995\Sep Sci Tec30, 3287.pdf](1995/Sep%20Sci%20Tec30,%203287.pdf)

Abstract: In this study, acrylamide-maleic acid (AAm/MA) hydrogels in the form of rod have been prepared by gamma-radiation. They have been used for adsorption of some heavy metal ions such as uranium, iron, and copper. For the hydrogel containing 40 mg of maleic acid and irradiated at 3.73 kGy, maximum and minimum swellings in the aqueous solutions of the heavy metal ions have been observed with water (1480%) and the aqueous solution of iron(III) nitrate (410%), respectively. Diffusions of water and heavy metal ions onto hydrogels have been found to be of the non-Fickian type of diffusion. In experiments of uranyl ions adsorption, Type II adsorption has been found. One gram of AAm/MA hydrogels sorbed 14-86 mg uranyl ions from solutions of uranyl acetate, 14-90 mg uranyl ions from solutions of uranyl nitrate, 16-39 mg iron ions from solutions of iron(IV) nitrate, and 28-81 mg copper ions from solutions of copper acetate, while acrylamide hydrogel did not sorb any heavy metals ions.

Keywords: Hydrogel, Poly(Acrylamide Maleic Acid), Adsorption, Uranyl Ion, Heavy Metal Ions, Amidoxime Groups, Polymer

Carriere, P.P.E., Reed, B.E. and Cline, S.R. (1995), Retention and release of lead by a silty loam and a fine sandy loam. II. Kinetics. *Separation Science and Technology*, **30** (18), 3471-3487.

Full Text: [1995\Sep Sci Tec30, 3471.pdf](1995/Sep%20Sci%20Tec30,%203471.pdf)

Abstract: The kinetics of lead retention and release by a silty loam and a fine sandy loam was investigated. Batch experiments were conducted to assess the rate and degree of lead retention. The rate of lead sorption onto the soils was determined using lead solution with concentrations of 10, 100 and 1000 mg/L. Kinetics of lead retention was very rapid for both soils. Lead was completely removed from both the 10 and 1.00 mg/L solutions, but partially removed from the 1000 mg/L solutions within the first hour. It was noted, that the rate of lead soption was faster for the 10 and 100 mg/L than the 1000 mg/L solutions. The slower retention kinetics for both soils at the 1000 mg/L lead contamination level can be attributed to surface precipitation effects. Batch extraction experiments were also performed using three different types of washing solutions. Lead release using the CaCl2 washes was less than the release using EDTA and HCl, but the kinetics of lead release was initially rapid with most of the removal occurring within the first hour for the three washing solutions. It was observed that the lead solution concentration has no effect on lead removAl-During the rapid step for the HCl and EDTA washes, but has some effect for CaCl2 washes.

Keywords: Heavy-Metals, Adsorption

Saraydin, D., Karadag, E. and Güven, O. (1996), Adsorption of some basic dyes by acrylamide-maleic acid hydrogels. *Separation Science and Technology*, **31** (3), 423-434.

Full Text: [1996\Sep Sci Tec31, 423.pdf](1996/Sep%20Sci%20Tec31,%20423.pdf)

Abstract: In this study, acrylamide-maleic acid (AAm/MA) hydrogels containing different quantities of maleic acid have been irradiated with gamma-radiation. They have been used in experiments on swelling, diffusion and the adsorption of basic dyes such as Methylene Blue, methyl violet and nile blue. Acrylamide-maleic acid hydrogel containing 40 mgmaleic acid and irradiated at 3.73 kGy has been used for swelling and diffusion studies in water and solutions of basic dyes. For this hydrogel, maximum and minimum swellings have been observed with solutions of nile blue (2000% swelling) and water (1480% swelling). Diffusions of water and dyes within hydrogels have been found to be non-Fickian in character. In experiments on the adsorption of dyes, Type III adsorption has been found. One gram of AAm/MA hydrogel sorbed 0.3-2.2 mg of Methylene Blue, 0.3-3.4 mg of methyl violet and 1.6-3.9 mg of nile blue, while acrylamide hydrogel has not sorbed any basic dye. This result shows that AAm/MA hydrogel can be used as a sorbent for water pollutants such as dyes and immobilization of these organic contaminants in the hydrogels from wastewater can solve one of the most important environmental problems of the textile industry.

Keywords: Hydrogel, Poly(Acrylamide Maleic Acid), Swelling, Adsorption, Basic Dyes, Binding, Blue

Salih, B., Denizli, A. and Piskin, E. (1996), Congo Red-Attached poly (EGDMA-HEMA) microbeads for removal of heavy metal ions. *Separation Science and Technology*, **31** (5), 715-727.

Full Text: [1996\Sep Sci Tec31, 715.pdf](1996/Sep%20Sci%20Tec31,%20715.pdf)

Abstract: In this study we investigated a new sorbent system, Congo Red-attached poly (EGDMA-HEMA) microbeads, for removal of heavy metal ions from aqueous solutions. Poly (EGDMA-HEMA) microbeads were prepared by suspension copolymerization of ethylene glycol dimethacrylate (EGDMA) and hydroxyethyl methacrylate (HEMA) by using poly (vinyl alcohol), benzoyl peroxide and toluene as the stabilizer, the initiator and the diluent, respectively. Congo Red molecules were then covalently attached to these microbeads. Microbeads (150-200 µm in diameter) with a swelling ratio of 55% and carrying 14.5 µmol Congo Red/g poly mer were used in the adsorption/desorption studies. Adsorption rate and capacity of the microbeads for selected metal ions, i.e., Cd(II), Cu(II), Zn(II) and Pb(II), were investigated in aqueous media containing different amounts of these ions (1-500 ppm) and at different pH values (1.5-7.5). Very high adsorption rates were observed at the beginning and adsorption equilibria were then gradually achieved in about 5-90 minutes. The maximum adsorptions of metal ions onto the Congo Red attached microbeads were 18.3 mg/g for Cd(II), 2.9 mg/g for Cu(II), 53.8 mg/g for Zn(II) and 165 mg/g for Pb(II). However, when the metal ions competed (in the case of adsorption from their mixture), the amounts of adsorption for Cd(II), Zn(II) and Pb(II) were quite close. Desorption of metal ions was studied by using 2 M NaCl (pH 7.0) for Cd(II) ions and 0.1 M HNO3 (pH 1.0) for Cu(II), Zn(II) and Pb(II) ions. High desorption ratios (more than 85%) were achieved in all cases. Adsorption/desorption cycles showed the feasibility of repeated use of this novel sorbent system.

Keywords: Congo Red, Poly(Egdma-Hema) Microbeads, Heavy Metal Ions, Chelating Polymers, Activated Carbons, Amidoxime Groups, Surface-Acidity, Aluminum-Oxide, Trace-Metals, Sea-Water, Adsorption, Separation, Uranium

Solari, P., Zouboulis, A.I., Matis, K.A. and Stalidis, G.A. (1996), Removal of toxic metals by biosorption onto nonliving sewage sludge. *Separation Science and Technology*, **31** (8), 1075-1092.

Full Text: [1996\Sep Sci Tec31, 1075.pdf](1996/Sep%20Sci%20Tec31,%201075.pdf)

Abstract: Toxic metals, such as zinc, nickel and cadmium, can be removed from dilute aqueous solutions by sorption onto nonliving sewage sludge applied as finely dispersed biosorbent particles after sterilization and drying. A comparison between the suggested method and precipitation, the most common method used for metals removal, was conducted in parallel. The main parameters examined in single component systems include initial metal concentration, temperature and inhibition of the removal process by the existence of soluble constituents. Adsorption isotherms were employed to describe the metals uptake, the Langmuir types were found to fit the experimental data better than the Freundlich ones. Moreover, the desorption of metals from metal-loaded biomass was investigated. The possible selective separation of metals from binary and ternary mixtures by biosorption, which could lead to the recovery and recycling of the removed metals, was also examined by introducing an illustrative selectivity factor.

Ganguly, S.K. and Goswami, A.N. (1996), Surface diffusion kinetics in the adsorption of acetic acid on activated carbon. *Separation Science and Technology*, **31** (9), 1267-1278.

Full Text: [1996\Sep Sci Tec31, 1267.pdf](1996/Sep%20Sci%20Tec31,%201267.pdf)

Abstract: The recovery of acetic acid from industrial wastewaters is an important separation problem, and one of the routes suggested for this application is liquid phase adsorption on activated carbon adsorbents. Designing an adsorber for such applications requires knowledge of equilibrium isotherm as well as adsorption rate data. In the present work the kinetics of adsorption of acetic acid on activated carbon has been studied. A three-parameter isotherm model has been used to correlate the equilibrium data, and a combined external film transfer-surface diffusion model has been used to simulate the experimental adsorption rate data. The surface diffusivity values obtained range from 6 to 8.5×10-7 cm2/s, and the values show a dependence on surface loading. These surface diffusivity values can be used in modeling the column breakthrough behavior for this system.

Keywords: Aqueous-Phase, Model

Balköse, D., Ulutan, S., Özkan, F., Ülkü, S. and Köktürk, U. (1996), Flexible poly(vinyl chloride)-zeolite composites for dye adsorption from aqueous solutions. *Separation Science and Technology*, **31** (9), 1279-1289.

Full Text: [1996\Sep Sci Tec31, 1279.pdf](1996/Sep%20Sci%20Tec31,%201279.pdf)

Abstract: Flexible poly (vinyl chloride) (PVC) composites having natural zeolite clinoptillolite were prepared by plastisol-plastigel technology. Adsoption of Methylene Blue on each raw material and on composites was studied both from an equilibrium and a rate approach. It was observed that the adsorption capacity of zeolite decreased when it was embedded in composites. The equilibrium uptake of Methylene Blue increased with an increasing zeolite fraction in composites. Methylene blue was adsorbed from a 0.02 g.cm-3 aqueous solution slowly, but was nearly adsorbed completely with a composite having a 0.3 volume fraction of zeolite. The effective diffusion coefficient of Methylene Blue in composites was of the order of 10-13 m2.s-1 and decreased with increasing filler fraction.

? Wasay, S.A., Tokunaga, S. and Park, S.W. (1996), Removal of hazardous anions from aqueous solutions by La(III)- and Y(III)-impregnated alumina. *Separation Science and Technology*, **31** (10), 1501-1514.

Full Text: [1996\Sep Sci Tec31, 1501.pdf](1996/Sep%20Sci%20Tec31,%201501.pdf)

Abstract: New adsorbents, La(III)- and Y(III)-impregnated alumina, were prepared for the removal of hazardous anions from aqueous solutions. A commercially available alumina was impregnated with La(III) or Y(III) ions by the adsorption process. The change in the surface charge due to the impregnation was measured by acid/base titration. The adsorption rate and the capacity of the alumina for La(III) and Y(III) ions were determined. The adsorption characteristics of the La(III)- and Y(III)-impregnated alumina and the original alumina for fluoride, phosphate, arsenate and selenite ions were analyzed under various conditions. The pH effect, dose effect, and kinetics were studied. The removal selectivity by the impregnated alumina was in the order fluoride > phosphate > arsenate > selenite. The impregnated alumina has been successfully applied for the removal of hazardous anions from synthetic and high-tech industrial wastewaters.

Keywords: Selenite Adsorption, Water

? Chang, C.Y., Tsai, W.T. and Lee, H.C. (1996), Desorption kinetics of N, N-dimethylformamide vapor from granular activated carbon and hydrophobic zeolite. *Separation Science and Technology*, **31** (12), 1675-1686.

Full Text: [1996\Sep Sci Tec31, 1675.pdf](1996/Sep%20Sci%20Tec31,%201675.pdf)

Abstract: Such thermodynamic properties as enthalpy, free energy, and entropy of adsorption have been computed for N, N-dimethylformamide (DMF) vapor on two commercial adsorbents: coconut shell Type PCB of activated carbon and Type DAY of hydrophobic zeolite. The computation is based on the Langmuir adsorption isotherms obtained at 293, 303, and 313 K as reported by Tsai et al. The laden adsorbents were regenerated with hot inert nitrogen gas and studied by thermal gravimetric analysis at three different heating rates. The apparent activation energies (E(des)) Of thermal desorption were determined by using the Friedman method. The zeolite DAY has an adsorption potential higher than that of activated carbon PCB as indicated by the more negative value of the adsorption enthalpy of DMF vapor. The average value of E(des) of zeolite DAY is larger than that of activated carbon PCB.

Keywords: Adsorption

Kondo, K., Sumi, H. and Matsumoto, M. (1996), Adsorption characteristics of metal ions on chitosan chemicallymodified by D-galactose. *Separation Science and Technology*, **31** (12), 1771-1775.

Full Text: [1996\Sep Sci Tec31, 1771.pdf](1996/Sep%20Sci%20Tec31,%201771.pdf)

Abstract: The adsorption characteristics of metal ions on chitosan chemically modified by D-galactose were examined. The pH dependency on the distribution ratio was found to be affected by the valency of the metal ion, and the apparent adsorption equilibrium constants of the metal ions were determined. The order of adsorption of the metal ions is Ga > In > Nd > Eu for the trivalent metal ions and Cu> Ni > Co for the divalent metal ions. It is believed that amino and hydroxyl groups in the chitosan act as a chelating ligand.

Keywords: Adsorption, Adsorption Equilibrium, Chemically Modified Chitosan, Chitin, Chitosan, Dependency, Derivatives, Distribution, Equilibrium, Galactose, Glutamate Glucan, Hydroxyl, Ion, Metal, Metal Ions, Modified, pH, Sorption, Uranium

Juang, R.S., Tseng, R.L., Wu, F.C. and Lee, S.H. (1996), Liquid-phase adsorption of phenol and its derivatives on activated carbon fibers. *Separation Science and Technology*, **31** (14), 1915-1931.

Full Text: [1996\Sep Sci Tec31, 1915.pdf](1996/Sep%20Sci%20Tec31,%201915.pdf)

Abstract: The adsorption of three phenolic compounds from aqueous solutions on activated carbon fibers was measured in the 2-5 mol/m3 concentration range at 303 K. High adsorption capacities were obtained for the substituted phenols. Several isotherm equations were tried in order to find an equation which correlates the equilibrium data best. Among the equations tried, the three-parameter equation of Jossens *et al.* derived thermodynamically and based on a heterogeneous surface adsorption theory was found to be the most satisfactory over the entire range of concentrations. A rate parameter was obtained and used to describe the adsorption process on a quantitative basis. This rate parameter could be successfully correlated against the initial solute concentration.

Keywords: Dilute Aqueous-Solution, Fly-Ash, Removal, Adsorbents, Equilibrium, Sorption, Organics, Silica, Water, Color

? Al Mansi, N.M. (1996), Decolorizing wastewater in a fixed bed using natural adsorbents. *Separation Science and Technology*, **31** (14), 1989-1995.

Full Text: [1996\Sep Sci Tec31, 1989.pdf](1996/Sep%20Sci%20Tec31,%201989.pdf)

Abstract: The possibility of using sawdust as an adsorbent in a fixed-bed adsorber in decolorizing wastewater as well as batchwise was studied. The Freundlich isotherm was obtained for the adsorption of a basic dyestuff (Maxillon Blue) on wood. The factors studied under isothermal adsorption conditions include feed input velocity, wood particle size, and bed height. The controlling step of adsorption at relatively high velocities is the internal diffusion within the pores rather than the external diffusion. The results showed that the best operating conditions were obtained at an intermediate feed velocity of 0.12 cm/s, a particle diameter of 0.018 cm, and a bed height of 10 cm.

Dasmahapatra, G.P., Pal, T.K., Bhadra, A.K. and Bhattacharya, B. (1996), Studies on separation characteristics of hexavalent chromium from aqueous solution by fly-ash. *Separation Science and Technology*, **31** (14), 2001-2009.

Full Text: [1996\Sep Sci Tec31, 2001.pdf](1996/Sep%20Sci%20Tec31,%202001.pdf)

Abstract: Hexavalent chromium has been separated from an aqueous solution by fly ash. The particle size distribution and physical properties of fly ash have been illustrated. It is observed that the percent removal of Cr6+ by fly ash is affected by its concentration in aqueous solution, temperature, particle size and pH. Better separation is obtained at acidic pH and at higher temperature. Particle size has a nonsignificant effect on separation. The reaction kinetics of separation follows first-order kinetics more satisfactorily at higher temperature.

Keywords: Chromium, Fly Ash, Ion Exchange, Separation, Adsorption

Juang, R.S. and Swei, S.L. (1996), Effect of dye nature on its adsorption from aqueous solutions onto activated carbon. *Separation Science and Technology*, **31** (15), 2143-2158.

Full Text: [1996\Sep Sci Tec31, 2143.pdf](1996/Sep%20Sci%20Tec31,%202143.pdf)

Abstract: Liquid-phase adsorption of two dyes on activated carbon was measured in the 283-323 K temperature range. Higher capacity and faster kinetics of adsorption were obtained for a basic dye than for an acidic dye under comparable conditions, probably due to the different ionic natures of the dyes. The equilibrium data for acidic dye could be well described by the Freundlich equation, but the best-fit model for basic dye changed from the Langmuir to the Freundlich equations when the temperature was raised. In addition, the thermodynamic functions were determined. A plot of the fraction of adsorption against time1/2 was adopted to describe the adsorption process. It was shown that for an acidic dye the amount of adsorbent used played an important role in the adsorption mechanism.

Keywords: External Mass-Transfer, Color Removal, Fly-Ash, Textile Effluents, Pore Diffusion, Dyestuffs, Equilibrium, Adsorbents, Kinetics, Model

Inoue, K., Hirakawa, H., Ishikawa, Y., Yamaguchi, T., Nagata, J., Ohto, K. and Yoshizuka, K. (1996), Adsorption of metal ions on gallium(III)-templated oxine type of chemically modified chitosan. *Separation Science and Technology*, **31** (16), 2273-2285.

Full Text: [1996\Sep Sci Tec31, 2273.pdf](1996/Sep%20Sci%20Tec31,%202273.pdf)

Abstract: The oxine type of chemically modified chitosan was prepared by the template crosslinking method employing gallium(III) ion as a template ion. The functional groups of oxine were found to be incorporated into the polymer chain of chitosan at a oxine/glucosamine unit ratio of 1/3. This value agrees with that expected from molecular modeling computation by the molecular mechanics method, Adsorption of molybdenum(VI), vanadium(IV), indium(III), aluminum(III), zinc(II), iron(II), and Cadmium(II) together with gallium(III) on this chemically modified chitosan from dilute sulfuric acid solution was compared with that on the original chitosan. It was found that the pH at which the adsorption of these metals takes place on this chemically modified chitosan shifted to a lower pH than that on the original chitosan. The shift was the greatest for gallium(III) among the metal ions examined, which might be attributable to the template effect of gallium(III) ion. The maximum adsorption capacity of gallium(III) was evaluated as 1.17 mol/kg-dry adsorbent. The selective adsorption of small amounts of gallium(III) and indium(III) from an excess amount of zinc(II) was confirmed from the breakthrough profile of separation using a column packed with this chemically modified chitosan.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Capacity, Chemically Modified Chitosan, Chitosan, Crosslinking, Functional Groups, Ion, Iron(II), Metal Ions, Metals, Modeling, Modified, Molecular Modeling Computation, pH, Polymer, Profile, Selective, Separation, Sulfuric Acid, Template Crosslinking Method

Saraydin, D., Karadağ, E. and Güven, O. (1996), Behaviors of acrylamide/maleic acid hydrogels in uptake of some cationic dyes from aqueous solutions. *Separation Science and Technology*, **31** (17), 2359-2371.

Full Text: [1996\Sep Sci Tec31, 2359.pdf](1996/Sep%20Sci%20Tec31,%202359.pdf)

Abstract: Acrylamide/maleic acid (AAm/MA) hydrogels prepared by irradiating with gamma-radiation were used in experiments on swelling, diffusion, and uptake of some cationic dyes such as basic red 9 (BR-9), basic green 4 (BG-4), cresyl violet (CV), and basic blue 20 (BB-20). AAm/MA hydrogel containing 60 mg maleic acid and irradiated at 5.71 kGy has been used for swelling and diffusion studies in water and solutions of basic dyes. For this hydrogel, swelling studies indicated that swelling increased in the following order, BR-9 > BG-4 > CV > BB-20 > water. Diffusion of water and the dyes within hydrogels was found to be of a non-Fickian character. The uptake of the cationic dyes to AAm/MA hydrogels is studied by the batch adsorption technique at 25°C. In the adsorption experiments, Langmuir-type adsorption in the Giles classification system was found. Some binding and thermodynamic parameters for AAm/MA hydrogel-dye systems were calculated by using the Klotz method. Adsorption studies indicated that monolayer coverages of AAm/MA hydrogel by these dyes increased in the following order: BB-20 > CV > BG-4 > BR-9.

Keywords: Hydrogel, Poly(Acrylamide/Maleic Acid), Swelling, Adsorption, Cationic Dyes, Bovine Serum-Albumin, Adsorption, N-Vinyl-2-Pyrrolidone, Methacrylate, Binding

Chen, J.P. and Yiacoumi, S. (1997), Biosorption of metal ions from aqueous solutions. *Separation Science and Technology*, **32** (1-4), 51-69.

Full Text: [1997\Sep Sci Tec32, 51.pdf](1997/Sep%20Sci%20Tec32,%2051.pdf)

Abstract: Copper biosorption from aqueous solutions by calcium alginate is reported in this paper. The experimental section includes potentiometric titrations of biosorbents, batch equilibrium and kinetic studies of copper biosorption, as well as fixed-bed biosorption experiments. The potentiometric titration results show that the surface charge increases with decreasing pH. The biosorption of copper strongly depends on solution pH, the metal ion binding increases from 0 to 90 percent in pH ranging from 1.5 to 5.0. In addition, a decrease in ionic strength results in an increase of copper ion removal. Kinetic studies indicate that mass transfer plays an important role in the biosorption rate. Furthermore, a fixed-bed biosorption experiment shows that calcium alginate has a significant capacity for copper ion removal. The two-pK Basic Stern model Successfully represents the surface charge and equilibrium biosorption experimental data. The calculation results demonstrate that the copper removal may result from the binding of free copper and its hydroxide with surface functional groups of the biosorbents.

Keywords: Alginate Gel Beads, Modeling Adsorption, Interface, Sorption, Biomass, pH

Lee, S.H. and Yang, J.W. (1997), Removal of copper in aqueous solution by apple wastes. *Separation Science and Technology*, **32** (8), 1371-1387.

Full Text: [1997\Sep Sci Tec32, 1371.pdf](1997/Sep%20Sci%20Tec32,%201371.pdf)

Abstract: Removal of copper from a solution was investigated to evaluate the cation-exchange capacities of apple residues from agricultural wastes. The effects of solution pH, ionic strength, co-ion, ligands, initial metal concentrations, and particle size of apple residues were studied. The optimal pH range for copper removal by apple residues was shown to be from pH 5.5 to 7.0, and the maximum percentage of copper removal was 91.2%. Increasing ionic strength, up to 0.1 N, has little effect on metal uptake. The presence of co-ions such as lead decreases the removal capacity of copper as expected. The presence of ligands, such as EDTA and ammonia, also reduces metal removal efficiency due to the formation of a metal-ligand complexation in solution. Equilibrium of copper sorption was established very rapidly initially and decreased markedly after 1 hour. Equilibrium isotherms of copper fit the Langmuir equation adequately. Column experiments showed that the dynamic capacity of chemically modified apple residues was four to five times higher than that of raw residues which contained acidic groups such as carboxylic and phenolic functional groups. The adsorbed copper ions were completely recovered with three bed volumes of 0.5 N HCl. Thus, modified apple residues could be applied successfully for metal removal from wastewater.

Keywords: Biosorption

Huang, J.G. and Liu, J.C. (1997), Enhanced removal of As(V) from water with iron-coated spent catalyst. *Separation Science and Technology*, **32** (9), 1557-1569.

Full Text: [1997\Sep Sci Tec32, 1557.pdf](1997/Sep%20Sci%20Tec32,%201557.pdf)

Abstract: The effectiveness of pretreating a spent catalyst with an iron-salt solution to improve its As(V) removal capacity was studied. Various factors, such as types and concentrations of iron salt, pH, and initial As(V) concentration were investigated for their effects on the improvement of As(V) removal capacity. A significant increase in As(V) removal capacity can be achieved by iron-coated spent catalyst. Adsorption density of As(V) decreased with increasing pH. Langmuir adsorption isotherm was utilized to describe the adsorption reaction. Results from IR analysis and zeta potential measurement indicate that As(V) is specifically adsorbed onto iron-coated spent catalyst. This study shows that spent catalyst can be converted to a useful adsorbent for As(V) removal.

Keywords: Adsorption, Arsenic, pH, Spent Catalyst, Zeta Potential, Activated Carbon, Adsorption, Hydroxide, Flotation, Sorption, Copper, Sand

? Zouboulis, A.I., Matis, K.A., Lanara, B.G. and Loos-Neskovic, C. (1997), Removal of cadmium from dilute solutions by hydroxyapatite. II. Flotation studies. *Separation Science and Technology*, **32** (10), 1755-1767.

Full Text: [1997\Sep Sci Tec32, 1755.pdf](1997/Sep%20Sci%20Tec32,%201755.pdf)

Abstract: Dissolved-air flotation has been investigated in the present paper as a suitable solid/liquid separation technique, applied downstream for hydroxyapatite ultrafine particles which were used in a preliminary stage for the removal by sorption of toxic cadmium cations. The main parameters affecting this process were evaluated, including the necessary quantity of sorbent material in the dispersion, the proper pH values of Cd solutions, the type and concentration of supplementary inorganic flocculant agents (ferric chloride and aluminum sulfate), and the presence of additional surfactant added. The results obtained were considered to be promising. Under optimum conditions, over 95% of Cd-loaded hydroxyapatite particles were separated in a very short retention time.

Keywords: Metal-Ions, Minerals

Hasany, S.M., Najamuddin, and Ikram, M. (1997), Uptake of traces of selenite by manganese dioxide from aqueous solutions. *Separation Science and Technology*, **32** (12), 1945-1957.

Full Text: [1997\Sep Sci Tec32, 1945.pdf](1997/Sep%20Sci%20Tec32,%201945.pdf)

Abstract: Sorption of selenite onto manganese dioxide has been investigated with respect to shaking time, concentration of sorbent and sorbate, nature of electrolyte, and influence of cations and anions. The sorption of other metal ions has been studied using optimal conditions selected for maximum sorption of selenite. The surface area, average pore diameter, porosity, and solid phase density of the sorbent have been measured. The sorption data followed only the Dubinin-Radushkevich (D-R) sorption isotherm among all the isotherms tested. The sorption capacity of 51.2 nmol.g-1 and a constant beta related to sorption energy have been estimated to be -0.007521 mol2.kJ-2. The sorption energy is found to be 8.15 kJ.mol-1. The kinetics of the sorption follows the Lagergren equation in the initial stages. The first-order rate constant, k’, was evaluated to be 0.498 min-1 and of intraparticle diffusion rate 3.06×10-5 mol.g-.min-2. Among all the anions and cations tested, only carbonate, Fe(III), and citrate reduced the sorption significantly. The sorption data for other metal ions showed that Te(IV) can be separated from ions showing higher degree of sorption, especially Se(IV), As(III), Sb(V), and Eu(III). It can be concluded that manganese dioxide may be used for the separation of certain metal ions, their preconcentration from very dilute solutions, and for de contamination and treatment of industrial effluents.

Keywords: Adsorption Behavior, Acid-Solutions, Microamounts

? Petersen, F.W. and Van Deventer, J.S.J. (1997), Competitive adsorption of gold cyanide and organic compounds onto porous adsorbents. *Separation Science and Technology*, **32** (13), 2087-2103.

Full Text: [1997\Sep Sci Tec32, 2087.pdf](1997/Sep%20Sci%20Tec32,%202087.pdf)

Abstract: Activated carbon has had a tremendous impact on the technology of gold recovery from leached liquors. Ion-exchange resins have been proposed as possible alternatives to carbon, while ion- exchange fibers and membranes were investigated recently as adsorbents for metal recovery in view of their fast rate of uptake. This paper deals with the competitive adsorption of organic compounds and gold cyanide onto activated carbon, ion- exchange resin, ion-exchange fiber, and membrane. Loadings of organic compounds were measured on gold equilibrated adsorbents and compared to loadings on virgin adsorbents. Both the kinetic and equilibrium parameters in a film/surface diffusion model were affected, which indicated a competitive type of mechanism between gold cyanide and organic compounds. A two-component Freundlich-type isotherm fitted the equilibrium for adsorption on carbon, membrane, and fiber. Furthermore, low molecular mass organic substances revealed a smaller inhibiting effect on gold adsorption than long-chain or high molecular mass organic compounds

Keywords: Activated Carbon, Adsorption, Membrane

Hsu, Y.C., Chiang, C.C. and Yu, M.F. (1997), Adsorption behavior of basic dyes on activated clay. *Separation Science and Technology*, **32** (15), 2513-2534.

Full Text: [1997\Sep Sci Tec32, 2513.pdf](1997/Sep%20Sci%20Tec32,%202513.pdf)

Abstract: Activated clay was used to study the adsorption behavior of dyestuffs in synthetic wastewater containing dyestuffs. Three basic dyes were used: C.I. Basic Red 18 (or BR18), C.I. Basic Red 46 (BR46), and C.I. Basic Yellow 28 (BY28). Adsorption occurred almost instantaneously upon contact. The mechanism of adsorption was explained by a charge to the electrostatic attractive force described in the Langmuir adsorption isotherm. The mass transfer coefficient was also calculated by the external mass transfer model in an adsorbent according to McKay et al. Parameters including species of basic dyes, initial concentration, temperature, size of adsorbent, and NaCl were extensively investigated.

Keywords: Aqueous-Solutions, Transport Processes, Bagasse Pith, Fly-Ash, Removal, Particles, Adsorption, Activated Clay, Wastewater, Basic Dye, Mass Transfer

Gupta, V.K., Rastogi, A., Dwivedi, M.K. and Mohan, D. (1997), Process development for the removal of zinc and cadmium from wastewater using slag: A blast furnace waste material. *Separation Science and Technology*, **32** (17), 2883-2912.

Full Text: [1997\Sep Sci Tec32, 2883.pdf](1997/Sep%20Sci%20Tec32,%202883.pdf)

Abstract: Blast furnace slag, a waste generated in steel plants in India, has been converted into a low cost potential adsorbent. The resulting product has been characterized and used for the removal of zinc and cadmium. The effect of particle size, contact time, and surface loading of zinc and cadmium on the adsorbent for their removal have been studied at the optimum pH (6.0 for Zn2+ and 5.0 for Cd2+). Kinetic studies were undertaken to show the mechanistic aspects of the process and to obtain the thermodynamic parameters. Sorption data have been correlated with both Langmuir and Freundlich adsorption models. Column operations were also performed in an attempt to simulate industrial conditions. Some feasibility experiments have been performed with a view to recovering Zn2+ and Cd2+ and for the chemical regeneration of the spent columns without dismantling them.

Keywords: Metal-Ions, Adsorption, Water, Lead, Equilibrium, Copper(II), Adsorbent, Chromium, Slurry, Blast Furnace Slag, Adsorption, Wastewater Treatment, Adsorbent, Zinc and Cadmium

Smith, E.H. (1998), Modeling batch kinetics of cadmium removal by a recycled iron adsorbent. *Separation Science and Technology*, **33** (2), 149-168.

Full Text: [1998\Sep Sci Tec33, 149.pdf](1998/Sep%20Sci%20Tec33,%20149.pdf)

Abstract: The kinetics of cadmium adsorption onto a recycled iron-bearing material is investigated. Batch rate data are analyzed using a surface reaction rate model, solved analytically, and a dual rate diffusion model solved numerically. Experimental investigations examined the effects of sorbent particle size in the 0.06-0.5 mm diameter range and pH in the 4-7 range. While both rate models can describe time-concentration data for cadmium well, particularly for the larger granular sizes of sorbent, the analysis reveals a substantial variation in the relevant rate coefficients with particle radius, r, suggesting diffusion versus surface-controlled reaction kinetics. The second-order rate constant for the surface reaction model and the intraparticle diffusion coefficient of the dual rate diffusion model, represented as surface diffusion, were proportional to 1/r.

Keywords: Adsorption, Batch Kinetics, Cadmium, Diffusion, Iron Fines, Surface Reaction, Heavy-Metals, Adsorption, Oxide, Oxyhydroxide, Lead

? Biškup, B. and Subotić, B. (1998), Removal of heavy metal ions from solutions by means of zeolites. I.Thermodynamics of the exchange processes between cadmium ions from solution and sodium ions from zeolite A. *Separation Science and Technology*, **33** (4), 449-466.

Full Text: [1998\Sep Sci Tec33, 449.pdf](1998/Sep%20Sci%20Tec33,%20449.pdf)

Abstract: Relationships between corrected selectivity coefficient (K-C) and fraction of the exchanged cadmium ions in zeolite A (f(Cd, z)) were determined from data obtained by measuring the concentrations of sodium and cadmium ions in both the solid and the liquid phase at equilibrium of the exchange processes between cadmium ions from solution and sodium ions from zeolite A at different total ion concentrations and different temperatures. Thermodynamic equilibrium constants (K-a) calculated from the corresponding Kielland’s plots (K-C vs f(Cd, z) plots) were used for the calculation of the appropriate values of standard free energy (ΔG°) standard enthalpy (ΔH°), and standard entropy (Δ°). The influence of the degree of exchange on the activity coefficients of sodium and cadmium ions in zeolite is also considered.

Keywords: Zeolite A, Ion Exchange, Sodium Ions, Cadmium Ions, Exchange Equilibrium, Thermodynamic Data, Waste-Water

? Colella, C., De’ Gennaro, M., Langella, A. and Pansini, M. (1998), Evaluation of natural phillipsite and chabazite as cation exchangers for copper and zinc. *Separation Science and Technology*, **33** (4), 467-481.

Full Text: [1998\Sep Sci Tec33, 467.pdf](1998/Sep%20Sci%20Tec33,%20467.pdf)

Abstract: Chabazite and phillipsite, two zeolites widespread in many volcaniclastic deposits in central-southern Italy, were evaluated as cation exchangers for the removal of copper and zinc from aqueous solution. Equilibrium and kinetics of copper and zinc exchange reactions for sodium were investigated in order to verify the selectivity and the uptake rate of both zeolites for these heavy metals. Thermodynamic quantities, such as equilibrium constant, K-a, and Delta G degrees, as well as rate constant, K, were computed, and they showed that Na-chabazite displays a moderate selectivity and a favorable kinetics for copper, whereas in ail the other cases uses in wastewater treatment are not recommended.

Keywords: Chabazite, Phillipsite, Ion Exchange, Copper, Zinc, Ion-Exchange, Lead Removal, Selectivity, Equilibria, Zeolites, Water

? Biškup, B. and Subotić, B. (1998), Removal of heavy metal ions from solutions by means of zeolites. I. Thermodynamics of the exchange processes between cadmium ions from solution and sodium ions from zeolite A. *Separation Science and Technology*, **33** (4), 449-466.

Full Text: [1998\Sep Sci Tec33, 449.pdf](1998/Sep%20Sci%20Tec33,%20449.pdf)

Abstract: Relationships between corrected selectivity coefficient (K-C) and fraction of the exchanged cadmium ions in zeolite A (f(Cd,z)) were determined from data obtained by measuring the concentrations of sodium and cadmium ions in both the solid and the liquid phase at equilibrium of the exchange processes between cadmium ions from solution and sodium ions from zeolite A at different total ion concentrations and different temperatures. Thermodynamic equilibrium constants (K-a) calculated from the corresponding Kielland’s plots (K-C vs f(Cd,z) plots) were used for the calculation of the appropriate values of standard free energy (Delta G degrees) standard enthalpy (Delta H degrees), and standard entropy (Delta S degrees). The influence of the degree of exchange on the activity coefficients of sodium and cadmium ions in zeolite is also considered.

Keywords: Cadmium, Cadmium Ions, Exchange Equilibrium, Heavy Metal, Heavy Metal Ions, Ion Exchange, Selectivity, Selectivity Coefficient, Sodium Ions, Thermodynamic Data, Waste-Water, Zeolite, Zeolite A, Zeolites

Chang, J.S. and Chen, C.C. (1998), Quantitative analysis and equilibrium models of selective adsorption in multimetal systems using a bacterial biosorbent. *Separation Science and Technology*, **33** (5), 611-632.

Full Text: [1998\Sep Sci Tec33, 611.pdf](1998/Sep%20Sci%20Tec33,%20611.pdf)

Abstract: This study investigated the behavior of selective adsorption on the biomass of *Pseudomonas aeruginosa* PU21 (Rip64) with solutions containing Pb, Cu, and Cd. Experiments were designed to quantitatively justify the biosorption preference of the biomass for the three metals. The multimetal adsorption equilibria were described by three models, two of which originated from single-component Langmuir isotherm, and the third one was established empirically. The multimetal adsorption results show that lead and copper significantly inhibited the adsorption of cadmium, while the effects of Cd on the adsorption of Cu and Pb were limited Lead was found to exhibit a slightly higher inhibition effect on Cu when the two adsorbate coexisted. The data obtained from the ion-exchange systems indicate that Pb and Cu appreciably replaced the preadsorbed Cd ions from the biosorbent, but the competition of Pb and Cu for the adsorption sites was comparative. For three-metal biosorption with equal initial molar concentrations, the relative surface coverage of Pb, Cu, and Cd on the biomass was approximately 55, 40, and 5%, respectively. A modified Langmuir-type model (Model 2), which took account of the heterogeneity and specificity of the adsorption sites, described the experimental results better than the traditional Langmuir isotherm (Model 1) did. of the three models examined, the empirical one (Model 3) showed the best fits for the two-metal adsorption data, whereas Model 2 had better prediction for the ternary adsorption results. In Model 3 the parameters determined from binary systems can be extrapolated to predict the adsorption equilibria of three-metal adsorption systems satisfactorily.

Keywords: Biosorption, Metals, Biomass, Removal, Cells

Tikhonov, N.A. and Zagorodni, A.A. (1998), Simulation of dual temperature ion-exchange separation process taking into account complex formation in solution. *Separation Science and Technology*, **33** (5), 633-653.

Full Text: [1998\Sep Sci Tec33, 633.pdf](1998/Sep%20Sci%20Tec33,%20633.pdf)

Abstract: A mathematical modeling of a dual temperature ion-exchange separation system is reported. The nonlinear nonequilibrium model created takes into account the following physicochemical processes: kinetics, ion-exchange reactions, complex formation accomplishing the chemical equilibria The model was applied for a system containing Cu2+ and Zn2+ in acidic sulfate solutions and the iminodiacetic ion-exchange resin Amberlite IRC-718. Good agreement to the experimental data was found. The dependence of the separation efficiency on different factors was tested. The advantage of nonequilibrium operations for the effective separation was shown. The optimal separation cycle was calculated for a sulfate solution containing 2.5 mM Cu and 20 mM Zn at pH 2.05. An ion-exchange column can process 207 bed volumes of the treated solution during one cycle. The effluent is separated for three fractions. The first fraction (75 bed volumes) is the solution containing the 9 times reduced Cu concentration. The second one (36 bed volumes) is the concentrate of Cu. The third Fraction is mixed and recycled for repeated treatment.

Alam, M.S., Inoue, K., Yoshizuka, K. and Ishibashi, H. (1998), Adsorptive separation of rhodium(III) using Fe(III)-templated oxine type of chemically modified chitosan. *Separation Science and Technology*, **33** (5), 655-666.

Full Text: [1998\Sep Sci Tec33, 655.pdf](1998/Sep%20Sci%20Tec33,%20655.pdf)

Abstract: The oxine type of chemically modified chitosan was prepared by the template crosslinking method using Fe(III) as a template ion. Batchwise adsorption of rhodium(II) on this chemically modified chitosan was examined from chloride media in the absence and presence of a large amount of tin(II). It was observed that the Fe(III)templated oxine type of chemically modified chitosan shows better performance for rhodium adsorption than that of the original chitosan. When Sn(II) is absent from the solution, Rh(III) is hardly adsorbed on the modified chitosan and the order of selectivity of the adsorption of Rh(III), Pt(IV), and Cu(II) was found to be Pt(IV) > Cu(II) approximate to Rh(III). On the other hand, adsorption of rhodium is significantly increased in the presence of Sn(II) and the selectivity order of the adsorption was drastically changed to Rh(LII) > Pt(IV) >> Cu(II), which ensures selective separation of Rh(III) from their mixture. Adsorption of Rh(III) increases with an increase in the concentration of Sn(II) in the aqueous solution, and maximum adsorption is achieved at a molar ratio, [Sn]/[Rh], of >6. The adsorption of Rh(III) decreases at a high concentration of hydrochloric acid. The maximum adsorption capacity was evaluated to be 0.92 mol/kg-dry adsorbent. Stripping tests of rhodium from the loaded chemically modified chitosan were carried out using different kinds of stripping agents containing some oxidizing agent. The maximum stripping of rhodium under these experimental conditions was found to be 72.5% by a single contact with 0.5 M HCl + 8 M HNO3.

Keywords: Hydrochloric-Acid Solutions, Metal-Ions

Aksu, Z., Özer, D., Özer, A., Kutsal, T. and Çağlar, A. (1998), Investigation of the column performance of cadmium(II) biosorption by *Cladophora crispata* flocs in a packed bed. *Separation Science and Technology*, **33** (5), 667-682.

Full Text: [1998\Sep Sci Tec33, 667.pdf](1998/Sep%20Sci%20Tec33,%20667.pdf)

Abstract: In this study the biosorption of Cadmium(II) ions to dried flocs of *Cladophora crispata*, a kind of green algae, was investigated in a packed bed column. The Cadmium(II) removal performance of the column was investigated as a function of the Cadmium(II)-bearing solution flow rate and the inlet Cadmium(II) concentration. Removal and total removal percentages of Cadmium(II) related to flow volume were determined by evaluating the breakthrough curves obtained at three different flow rates for two different constant inlet concentrations. At the lowest flow rate the effect of inlet Cadmium(II) concentration on the column capacity was also investigated. Data confirmed that early saturation and lower Cadmium(II) removals were observed at higher flow rates and at higher Cadmium(II) concentrations. Column experiments also showed that maximum specific Cadmium(II) uptake values of C, crispata flocs were as higher as those of other biomass sorbents.

Keywords: *Saccharomyces-Cerevisiae*, Metal-Cations, Heavy-Metals, Cell-Walls, Biomass, Ions, Vulgaris, Binding, Removal, Packed Bed Column, Flocs of *Cladophora crispata*, Cadmium(II) Biosorption

Lee, M.Y., Shin, H.J., Lee, S.H., Park, J.M. and Yang, J.W. (1998), Removal of lead in a fixed-bed column packed with activated carbon and crab shell. *Separation Science and Technology*, **33** (7), 1043-1056.

Full Text: [1998\Sep Sci Tec33, 1043.pdf](1998/Sep%20Sci%20Tec33,%201043.pdf)

Abstract: Crab shell particles (Protunus trituberculatus) and activated carbon (Norit 0,8 SUPRA) were used as packing materials in a fixed-bed column. When 1 g crab shell was added in a column packed with 10 g activated carbon, breakthrough occurred at 1500 bed volumes as compared to 380 bed volumes for 10 g activated carbon only. The addition of crab shell particles into an activated carbon column resulted in an increased uptake of lead. The dramatic improvement might be attributed to an increase in CO32- and OH- available for binding lead. From the results of SEM, XRD, and FT-IR analyses, the major mechanism of lead removal was based on dissolution of CaCO3 in the crab shell followed by precipitation of Pb-3(CO3)2(OH)2(S) on the surface of activated carbon. The lead uptake increased twofold when the influent lead concentration was increased from 10 to 50 mg, L.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Breakthrough, Column, Copper, Crab Shell, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Bed Column, Heavy-Metals, Lead, Precipitation, Removal, Waste Streams

Al-Asheh, S. and Duvnjak, Z. (1998), Binary metalsorption by pine bark: Study of equilibria and mechanisms. *Separation Science and Technology*, **33** (9), 1303-1329.

Full Text: [1998\Sep Sci Tec33, 1303.pdf](1998/Sep%20Sci%20Tec33,%201303.pdf)

Abstract: Pine bark was able to sorb cadmium, copper, and nickel ions from aqueous solutions. Binary equilibrium data from the combination of these metals were collected in this work using this sorbent. These data were modeled using three types of binary component equilibrium isotherms, all of which resulted in good fitting of the experimental data, with the Langmuir-Freundlich model resulting in their best representation. In general, the capacity of bark for each metal in the binary system was lower than in the single metalsystems, The study also examined the mechanisms of metal biosorption by bark. Scanning electron microscopy (SEM) and energy-dispersive xray (EDX) microanalyses revealed that metal ions were sorbed mainly at the cell wall of the bark and only a small amount of ions diffused into the cytoplasm. Both the EDX analysis and the atomic absorption spectrophotometry (AAS) measurements showed that ion exchange was an important mechanism in this sorption process. Electron spin resonance (ESR) tests demonstrated that free radicals from the sorbent also have a significant role in the sorption processes.

Keywords: Adsorbents, Adsorption, Agricultural By-Products, Aqueous-Solutions, Bark, Biosorption, Biosorption Equilibria, Cadmium, Combination, Copper, Edx, Equilibrium Isotherms, Heavy-Metals, Ion Exchange, Ion-Exchange, Metal, Metal Ions, Metal Sorption, Metals, Nickel, Pine Bark, Protons, Removal, *Rhizopus-arrhizus* Biomass, SEM, Sorbent, Sorption

Gupta, V.K., Mohan, D. and Sharma, S. (1998), Removal of lead from wastewater using bagasse fly ash: A sugar industry waste material. *Separation Science and Technology*, **33** (9), 1331-1343.

Full Text: [1998\Sep Sci Tec33, 1331.pdf](1998/Sep%20Sci%20Tec33,%201331.pdf)

Abstract: Bagasse fly ash, a waste generated in sugar industries in India, has been converted into a low cost adsorbent and has been used for the removal of lead from aqueous solutions in the 4.80×10-4 to 4.83×10-3 M concentration range, Maximum removal takes place at pH 3.0 using 10 g.L-1 of the adsorbent of particle size 150-200 mesh. The effect of the presence of other metal ions, temperature, and contact time has also been studied. Sorption data have been correlated with both Langmuir and Freundlich adsorption models. The adsorbent has been satisfactorily used for the removal of Pb2+ from the effluent of a metal-finishing plant.

Keywords: Metal-Ions, Adsorption, Water, Equilibrium, Sorption, Lead, Wastewater Treatment, Low Cost Adsorbent, Adsorption, Bagasse Fly Ash, Metal Ions, Solid Waste Utilization

? Kwon, S.C., Song, D.I. and Jeon, Y.W. (1998), Adsorption of phenol and nitrophenol isomers onto montmorillonite modified with hexadecyltrimethylammonium cation. *Separation Science and Technology*, **33** (13), 1981-1998.

Full Text: [1998\Sep Sci Tec33, 1981.pdf](1998/Sep%20Sci%20Tec33,%201981.pdf)

Abstract: Single- and two-component competitive adsorptions were carried out in a batch adsorber to investigate the adsorption behavior of phenol and 2-, 3-, and 4-nitrophenols in aqueous solution at 25°C onto hexadecyltrimethylammonium (HDTMA)-treated montmorillonite. HDTMA cation was exchanged for metal cations on the montmorillonite to prepare HDTMA-montmorillonite, changing its surface property from hydrophilic to organophilic. Effective solid diffusivity of HDTMA cation in the montmorillonite particle was estimated to be about 3×10-12 cm2/s by fitting the film-solid diffusion model to a set of HDTMA adsorption kinetic data onto montmorillonite. Adsorption affinity on HDTMA-montmorillonite was found to be in the order 3-nitrophenol approximate to 4-nitrophenol > 2-nitrophenol > phenol. The Langmuir and the Redlich-Peterson (RP) adsorption models were used to analyze the single component adsorption equilibria. The ideal adsorbed solution theory (IAST) and the Langmuir competitive model (LCM) were used to predict the multicomponent competitive adsorption equilibria. These models yielded favorable representations of both individual and competitive adsorption behaviors.

Keywords: Adsorption, Adsorption Kinetic, Behavior, Diffusion, Hdtma, Hexadecyltrimethylammonium, Hydrophilic, Ideal, Kinetic, Langmuir, Model, Models, Modified, Montmorillonite, Organic Phenols, Particle, Phenol, Predict, Smectite, Sorption, Surface, Water

? Song, H.K. and Lee, K.H. (1998), Adsorption of carbon dioxide on chemically modified carbon adsorbents. *Separation Science and Technology*, **33** (13), 2039-2057.

Full Text: [1998\Sep Sci Tec33, 2039.pdf](1998/Sep%20Sci%20Tec33,%202039.pdf)

Abstract: Carbon adsorbents were chemically modified to have base sites on their surfaces, and the adsorption characteristics of carbon dioxide on them were investigated. Three kinds of carbon materials were used as support materials: two activated carbons and a carbon black. Base sites were introduced by impregnating the support materials with calcium acetate solution, followed by calcination at 700°C for 2 hours in an inert gas flow. Chemical modification reduced the surface areas of adsorbents due to the blocking of micropores. Irreversible adsorption of carbon dioxide occurs up to 300°C due to chemisorption. However, reversible adsorption was possible by pretreating adsorbents with carbon dioxide. Strong interaction between carbon dioxide and base sites enhanced adsorption of carbon dioxide at higher temperatures up to 250°C.

Keywords: Acetate, Adsorbents, Adsorption, Calcium, Carbon, Carbon Adsorbents, Carbon Dioxide, Chemisorption, Flow, Gas, Interaction, Materials, Modification, Modified, Separation, Sites, Surface, Surfaces

Khalid, N., Ahmad, S., Kiani, S.N. and Ahmed, J. (1998), Removal of lead from aqueous solutions using rice husk. *Separation Science and Technology*, **33** (15), 2349-2362.

Full Text: [1998\Sep Sci Tec33, 2349.pdf](1998/Sep%20Sci%20Tec33,%202349.pdf)

Abstract: Rice husk, an agricultural waste, was studied as a potential scavenger of lead from various aqueous solutions. Physicochemical parameters such as selection of appropriate electrolyte, shaking time, and the concentrations of adsorbent and adsorbate were studied to optimize the conditions to be utilized on a commercial scale for the decontamination of effluents using a batch technique. Maximum adsorption was observed with 0.01 mol.dm-3 acid solutions (HNO3, HCl, H2SO4 and HClO4) using 1000 mg of adsorbent for a 4.82×10-5 mol.dm-3 lead concentration in less than 10 minutes equilibration time. Studies show that the adsorption decreases with an increase in the concentrations of all the acids. The adsorption data follows the Freundlich isotherm over the 9.65×10-5 to 4.83×10-3 mol.dm-3 range of lead concentration. The characteristic Freundlich constants, i.e., 1/n = 0.93±0.04 and A = 19.86±0.82 m.mol.g-1, have been computed for the sorption system. Thermodynamic parameters, i.e., Delta G degrees, Delta S degrees, and Delta H degrees, have also been calculated for the system.

Keywords: Heavy-Metal Ions, Atomic-Absorption Spectrometry, Trace-Metals, Sea-Water, Preconcentration, Adsorption, Binding, Seawater, Cadmium, Carbon

Kabay, N., Demircioglu, M., Yayli, S., Yuksel, M. and Saglam, M., Levison, P.R. (1999), Removal of metal ions from aqueous solution by cellulose ion exchangers. *Separation Science and Technology*, **34** (1), 41-51.

Full Text: [S\Sep Sci Tec34, 41.pdf](S/Sep%20Sci%20Tec34,%2041.pdf)

Abstract: The sorption of metal ions [Cd(II), Cu(II), Co(II), Pb(II), Zn(II), Cr(III), V(IV), V(V) from aqueous solution by Whatman cellulose ion exchangers was investigated as a function of pH. Whatman P-ll (ammonium cellulose phosphate) exhibited better performance than a fibrous anion exchanger (Whatman Cellect-Ion Exchanger DT-1) with respect to their sorption capacities for Cd(II), Cu(II), Co(II), Pb(II), Zn(II), and Cr(III). The Cellect-Ion anion exchanger (DT-1) had a higher sorption for V(IV) and V(V). The ionic form of cellulose phosphate (P-11) influenced their metal sorption capacities.

Keywords: Selective Separation, Preconcentration, Lead

Namasivayam, C. and Senthilkumar, S. (1999), Adsorption of copper(II) by ‘waste’ Fe(III)/Cr(III) hydroxide from aqueous solution and radiator manufacturing industry wastewater. *Separation Science and Technology*, **34** (2), 201-217.

Full Text: [S\Sep Sci Tec34, 201.pdf](S/Sep%20Sci%20Tec34,%20201.pdf)

Abstract: ‘Waste’ Fe(III)/Cr(III) hydroxide has been used as an adsorbent for the effective removal of copper from aqueous solution. The parameters studied include agitation time, Cu(II) concentration, adsorbent dose, temperature, and pH. The percent adsorption of Cu(II) increased with a decrease in the concentration of Cu(II) and an increase in temperature. Quantitative removal of Cu(II) by 50 mg/50 mt adsorbent was observed at pH 5.0 for a Cu(II) concentration of 40 mg/L. The equilibrium data fit well with the Langmuir isotherm. The adsorption capacity (Q0) calculated from the Langmuir isotherm was 92.59 mg/g at an initial pH of 5.0 at 32°C. Desorption of Cu(II) from a Cu(II)-loaded adsorbent was 55.4% at pH 3.0. Application of the adsorbent for the removal of Cu(II) was successfully demonstrated using radiator manufacturing industry wastewater.

Keywords: Removal, Water, Equilibrium, Adsorbents, Carbon, Cd(II)

Hasany, S.M., Saeed, M.M. and Ahmed, M. (1999), Retention of Hg(II) by solid mercury sulfide from acidic solution. *Separation Science and Technology*, **34** (3), 487-499.

Full Text: [S\Sep Sci Tec34, 487.pdf](S/Sep%20Sci%20Tec34,%20487.pdf)

Abstract: Mercury sulfide was prepared and characterized by measuring average pore size and surface area. The sorption of mercury onto mercury sulfide was investigated in detail with respect to sorptive medium, agitation time, sorbent and sorbate concentration, and temperature. The maximum sorption of mercury (>99.8) was achieved from 10-3 M hydrochloric acid solution using 50 mg mercury sulfide for 10 minutes. The sorption data of mercury followed the Langmuir isotherm over the entire concentration of mercury investigated whereas the Freundlich and Dubinin–Radushkevich isotherms were obeyed only up to low and moderate concentrations. Useful parameters like sorption capacity and energy have been evaluated using these isotherms. The variation of the equilibrium constant with temperature has the results Δ*H*=23.8±3.2 kJ.mol-1, Δ*S* = 130±10 J.mol-1, and Δ*G* = -13.5±0.4 kJ.mol-1 at 298 K. Among the ions tested, tartrate, fluoride, and citrate increase the sorption whereas Cu(II), Ba(II), Zn(II), Ni(II), Fe(II), and Cr(III) reduce the sorption significantly. Except for Y(III) (~91%), all the metal ions showed a lower affinity toward HgS, especially trivalent Ho, Fe, Sc, Tm, Ga, Dy, As, and Pr which showed sorption >1 and >10%. The mercury sulfide column can be used to separate Hg(II) from these trivalent metal ions.

Aksu, Z., Açikel, Ü. and Kutsal, T. (1999), Investigation of simultaneous biosorption of copper(II) and chromium(VI) on dried *Chlorella vulgaris* from binary metal mixtures: Application of multicomponet adsorption isotherms. *Separation Science and Technology*, **34** (3), 501-524.

Full Text: [S\Sep Sci Tec34, 501.pdf](S/Sep%20Sci%20Tec34,%20501.pdf)

Abstract: Although the biosorption of single metal ions to various kinds of microorganisms has been extensively studied and the adsorption isotherms have been developed for only the single metal ion situation, very little attention has been given to the bioremoval and expression of adsorption isotherms of multimetal ions systems. In this study the simultaneous biosorption of copper(II) and chromium(VI) to *Chlorella vulgaris* from a binary metal mixture was studied and compared with the single metal ion situation in a batch stirred system. The effects of pH and single-and dual-metal ion concentrations on the equilibrium uptakes were investigated. In previous studies the optimum biosorption pH had been determined as 4.0 for copper(II) and as 2.0 for chromium(VI). Multimetal ion biosorption studies were performed at these two pH values. It was observed that the equilibrium uptakes of copper(II) or chromium(VI) ions were changed due to the biosorption pH and the presence of other metal ions. Adsorption isotherms were developed for both single-and dual-metal ion systems at these two pH values, and expressed by the mono-and multicomponent Langmuir and Freundlich adsorption models. Model parameters were estimated by nonlinear regression. It was seen that the adsorption equilibrium data fitted very well to the competitive Freundlich model in the concentration ranges studied.

Keywords: Simultaneous Biosorption, Binary Mixture of Copper(II) and Chromium(VI), *Chlorella vulgaris*, Mono-and Multicomponent Adsorption Isotherms, Heavy-Metals, Waste-Water, *C. Vulgaris*, Cell-Walls, Ions, Biomass, Cadmium, Equilibria, Binding, Zinc

Huh, J.K., Song, D.I. and Jeon, Y.W. (1999), Dual-mode sorption model for single-and multisolute sorption onto organoclays. *Separation Science and Technology*, **34** (4), 571-586.

Full Text: [S\Sep Sci Tec34, 571.pdf](S/Sep%20Sci%20Tec34,%20571.pdf)

Abstract: The dual-mode sorption model (DSM) was applied to the single-solute sorption of 2-chlorophenol, 3-cyanophenol, and 4-nitrophenol from water onto organoclays. The three parameters contained in the DSM were determined for each solute by fitting to the single-solute isotherm data and subsequently utilized in competitive multisolute sorptions. A systematic method to determine the parameters for each solute was also suggested. The ideal adsorbed solution theory (IAST) coupled with the single-solute DSM and the competitive dual-mode sorption model (CDSM) extended to describe multisolute sorption were used to predict multisolute sorption onto organoclays and compared with the data to determine the predictive capabilities. The DSM was found to describe well single-solute sorption from water onto organoclays. The predictions from the CDSM and the IAST based on the DSM, though rather poor for some solutes, were generally in agreement with the multisolute sorption data. However, we could not tell at this stage which of the two competitive models is better.

Katoh, M., Katayama, K. and Tomida, T. (1999), Effect of temperature on air adsorption onto alkali metal ion-exchanged ZSM-5 zeolites. *Separation Science and Technology*, **34** (4), 599-608.

Full Text: [S\Sep Sci Tec34, 599.pdf](S/Sep%20Sci%20Tec34,%20599.pdf)

Abstract: Alkali metal ion-exchanged ZSM-5 zeolites, M-ZSM-5 (M = Li, Na, K, Rb, and Cs), were prepared from Na-ZSM-5 by a conventional ion-exchange method, and their abilities to adsorb air were investigated through measurements of the amount of gases adsorbed as determined from elution curves on chromatography. The interaction of adsorbed gases and cations of M-ZSM-5 were examined from IR spectra of the adsorbed gases. It was found that the nitrogen in air was adsorbed selectively on M-ZSM-5 adsorbents, particularly Li-ZSM-5 and Na-ZSM-5 at room temperature. IR spectra indicated that nitrogen in air was adsorbed predominantly on cation sites in M-ZSM-5 zeolites owing to their strong interactions with these sites.

Keywords: Adsorption, ZSM-5 Zeolite, Air, Temperature

Aksu, Z. and Çalik, A. (1999), Comparative study of the biosorption of iron(III)-cyanide complex anions to *Rhizopus arrhizus* and *Chlorella vulgaris*. *Separation Science and Technology*, **34** (5), 817-832.

Full Text: [S\Sep Sci Tec34, 817.pdf](S/Sep%20Sci%20Tec34,%20817.pdf)

Abstract: In this study a comparative biosorption of iron(III)-cyanide complex anions from aqueous solutions to *Rhizopus arrhizus* and *Chlorella vulgaris* was investigated. The iron(III)-cyanide complex ion-binding capacities of the biosorbents were shown as a function of initial pH, initial iron(III)-cyanide complex ion, and biosorbent concentrations. The results indicated that a significant reduction of iron(III)-cyanide complex ions was achieved at pH 13, a highly alkaline condition for both the biosorbents. The maximum loading capacities of the biosorbents were found to be 612.2 mg/g for R. arrhizus at 1996.2 mg/L initial iron(III)-cyanide complex ion concentration and 387.0 mg/g for *C. Vulgaris* at 845.4 mg/L initial iron(III)-cyanide complex ion concentration at this pH. The Freundlich, Langmuir, and Redlich-Peterson adsorption models were fitted to the equilibrium data at pH 3, 7, and 13. The equilibrium data of the biosorbents could be best fitted by all the adsorption models over the entire concentration range at pH 13.

Keywords: Iron(III)-Cyanide Complex Anions, *Rhizopus arrhizus*, *Chlorella vulgaris*, Biosorption, Batch Stirred Reactor, Aqueous-Solutions, Adsorption, Equilibrium, Cyanides, Removal, Dyes

Park, G.I., Park, H.S. and Woo, S.I. (1999), Influence of pH on the adsorption of uranium ions by oxidized activated carbon and chitosan. *Separation Science and Technology*, **34** (5), 833-854.

Full Text: [S\Sep Sci Tec34, 833.pdf](S/Sep%20Sci%20Tec34,%20833.pdf)

Abstract: The adsorption characteristics of uranyl ions on surface-oxidized carbon were com pared with those of powdered chitosan over a wide pH range. In particular, an extensive analysis was made on solution pH variation during the adsorption process or after adsorption equilibrium. Uranium adsorption on the two adsorbents was revealed to be strongly dependent on the initial pH of the solution. A quantitative comparison of the adsorption capacities of the two adsorbents was made, based on the isotherm data obtained at initial pH 3, 4, and 5. In order to analyze the adsorption kinetics incorporated with pH effects, batch experiments at various initial pH values were carried out, and solution pH profiles with the adsorption lime were also evaluated. The breakthrough behavior in a column packed with oxidized carbon was also characterized with respect to the variation of effluent pH. Based on these experimental results, the practical applicability of oxidized carbon for uranium removal from acidic radioactive liquid waste was suggested.

Keywords: Aqueous-Solutions, Removal, Water

Subramaniam, K., Yiacoumi, S. and Tsouris, C. (1999), Effect of copper and cadmium binding on flocculation of ferric oxide particles. *Separation Science and Technology*, **34** (6-7), 1301-1318.

Full Text: [S\Sep Sci Tec34, 1301.pdf](S/Sep%20Sci%20Tec34,%201301.pdf)

Abstract: The sorption of copper and cadmium ions from aqueous solutions by ferric oxide particles was studied using batch equilibrium and kinetic experiments. The sorption process was found to be pH dependent, with the uptake increasing at high pH values. An increase in equilibrium pH was observed when the initial pH was in the acidic range, and a decrease from initial values was observed in the basic range, in the case of both copper and cadmium sorption. The former phenomenon is due to competition between metal and proton binding, and the latter is due to precipitation mechanisms at high initial pH values. A large increase in the zeta potential of the particles from baseline values was observed during equilibrium sorption. This increase occurs as a result of surface charge neutralization due to metal ion uptake. Particle destabilization appears to occur as a result of metal ion sorption. Kinetic experiments indicate that the uptake of copper by Ferric oxide particles is a slow process. The pH histories were similar to those obtained in the sorption equilibrium experiments. Changes in the size distribution of the ferric oxide particles due to aggregate formation during uptake of ions were observed in the kinetic studies. These findings indicate a potential role of metal ion uptake in particle flocculation kinetics through alteration of the surface electrostatic potential.

Seco, A., Marzal, P., Gabaldón, C. and Ferrer, J. (1999), Study of the adsorption of Cd and Zn onto an activated carbon: Influence of pH, cation concentration, and adsorbent concentration. *Separation Science and Technology*, **34** (8), 1577-1593.

Full Text: [1999\Sep Sci Tec34, 1577.pdf](1999/Sep%20Sci%20Tec34,%201577.pdf)

Abstract: The single adsorption of Cd and Zn from aqueous solutions has been investigated on Scharlau Ca 346 granular activated carbon in a wide range of experimental conditions: pH, metal concentration, and carbon concentration. The results showed the efficiency of the activated carbon as sorbent for both metals. Metal removals increase on raising the pH and carbon concentration, and decrease on raising the initial metal concentration. The adsorption processes have been modeled using the surface complex formation (SCF) Triple Layer Model (TLM). The adsorbent TLM parameters were determined. Modeling has been performed assuming a single surface bidentate species or an overall surface species with fractional stoichiometry. The bidentate stoichiometry successfully predicted cadmium and zinc removals in all the experimental conditions. The Freundlich isotherm has been aso checked.

Keywords: Single, Complexation, Removal, Systems, Activated Carbon, Adsorption, Cadmium, Zinc, Triple Layer Model

Yu, Q.M. and Kaewsarn, P. (1999), Binary adsorption of copper(II) and Cadmium(II) from aqueous solutions by biomass of marine alga *Durvillaea potatorum*. *Separation Science and Technology*, **34** (8), 1595-1605.

Full Text: [1999\Sep Sci Tec34, 1595.pdf](1999/Sep%20Sci%20Tec34,%201595.pdf)

Abstract: Much work on the biosorption of heavy metals by low-cost, natural bionnass has been on the uptake of single metals. In practice, wastewaters often contain multiple heavy metal ions. In this paper the binary adsorption of copper(II) and Cadmium(II) by a pretreated biomass of the marine alga *Durvillaea potatorum* from aqueous solutions was studied. The results showed that the uptake capacities for each heavy metal of the binary system were lower when compared with the single metal biosorption for copper and cadmium, respectively, but the total capacities for the binary system were similar to those obtained for single metal biosorption. The uptake capacities for copper and cadmium increased as the equilibrium pH increased and reached a plateau at a pH around 5.0. The uptake process was relatively fast, with 90% of the adsorption completed within 10 minutes for copper and 30 minutes for cadmium, and equilibrium reached after about 60 minutes of stirring. The biosorption isotherms of binary systems were not significantly affected by equilibrium temperature. The presence of light metal ions in solution also did not affect adsorption significantly. The binary adsorption was successfully predicted by the extended Langmuir model, using parameters and capacities obtained from single component systems.

Keywords: Heavy-Metal Biosorption, Competitive Adsorption, Removal, Water, Ions, Biosorbents, Binding, Radiata, Lead, Zn, Biosorption of Heavy Metals, Binary Adsorption, Copper, Cadmium, *Durvillaea potatorum*, Marine Algae

Chang, J.S. and Chen, C.C. (1999), Biosorption of lead, copper, and cadmium with continuous hollow-fiber microfiltration processes. *Separation Science and Technology*, **34** (8), 1607-1627.

Full Text: [1999\Sep Sci Tec34, 1607.pdf](1999/Sep%20Sci%20Tec34,%201607.pdf)

Abstract: A hollow-fiber crossflow microfiltration membrane was utilized to retain a biomass of *Pseudomonas aeruginosa* PU21 for continuous biosorption of lead (Pb), copper (Cu), and cadmium (Cd) ions in single or ternary metalsystems. The results obtained from the microfiltration systems showed that in both single and ternary biosorption, the metal removal efficiency based on a molar basis war, clearly Pb > Cu > Cd. For a single-membrane process with an influent metal concentration of 200 µM and a flow rate of 350 mL/h, the effluent concentration of Pb and Cu satisfied the national regulations for an influent volume of 6.3 L. With a three-metal influent, the adsorption capacity of the biomass for Pb, Cu, and Cd was reduced 4, 50, and 74% compared to that for single-metal adsorption. Selective biosorption with a three-column sequential microfiltration operation exhibited an enhancement of 40 and 57% of total metal removal for Cu and Cd, respectively, over the results from single-membrane operation. The multimembrane operation also enabled locally optimal accumulation of Pb, Cu, and Cd at the first, second, and third stage, respectively. The regeneration efficiency of the biomass was 70% after three repetitive adsorption/desorption cycles, whereas the Pb recovery efficiency was maintained at nearly 90%. A rapid-equilibrium model (Model A) and a mass-transfer model (Model B) were used to describe the results of single-and multimetal biosorption with the microfiltration processes. Model A exhibited excellent prediction for the results of single-metal biosorption, while Model B was more applicable to interpret the multimetal biosorption data.

Keywords: *Pseudomonas-Aeruginosa* PU21, Heavy-Metals, Removal, Adsorption, Column, Cells, Biosorption, Microfiltration, Hollow Fiber, Heavy Metals, Multimetal Adsorption

Bialopiotrowicz, T., Blanpain-Avet, P. and Lalande, M. (1999), Characterization of inorganic carbon-supported microfiltration and ultrafiltration membranes by aqueous phenol adsorption. *Separation Science and Technology*, **34** (9), 1803-1818.

Full Text: [S\Sep Sci Tec34, 1803.pdf](S/Sep%20Sci%20Tec34,%201803.pdf)

Abstract: The adsorption of phenol on inorganic carbon-supported microfiltration and ultrafiltration membranes has been determined. Using the statistical Student’ s *t*-test, it has been shown that phenol adsorption data are well fitted to the Langmuir and BET isotherm equations. It was thus concluded that the adsorption of phenol was monomolecular and that the specific surface area (*SSA*) calculated from these data was essential. M1 and M2 ultrafiltration membranes were found to have a higher *SSA* than microfiltration M14 and carbon support membranes. Assuming that a simple model of the porous structure consisted of a packed bed of spherical particles, it was possible to determine an apparent average pore diameter from *SSA* data using the Carman-Kozeny equation. The *SSA* determined from phenol adsorption was found to be close to that measured from mercury porosimetry for the microfiltration membrane and carbon support. Such a result is due to the fact that there is a common basis between the Carman-Kozeny equation employed in the adsorption method and the determination of the ratio 4*V*/*A* (*V* = total porous volume, *A* = total pore area) in the mercury porosimetry method (as both methods consider a constant volume/surface ratio of the pores along the microporous membrane thickness).

Keywords: Phenol Adsorption, Specific Surface Area, Membrane Support Characterization, Inorganic Membranes

Juang, R.S., Shiau, J.Y. and Shao, H.J. (1999), Effect of temperature on equilibrium adsorption of phenols onto nonionic polymeric resins. *Separation Science and Technology*, **34** (9), 1819-1831.

Full Text: [S\Sep Sci Tec34, 1819.pdf](S/Sep%20Sci%20Tec34,%201819.pdf)

Abstract: The amounts of equilibrium adsorption of phenol and 4-chlorophenol from aqueous solutions on nonionic polymeric resins were measured in the 288-318 K temperature range. In general, these polymeric resins have a higher capacity for 4-chlorophenol at low solute concentrations but for phenol at higher solute concentrations. The adsorption data for both phenols were presented in terms of the number of adsorbed monolayers and the fraction of pore volume filled due to poor fit by the widely used Langmuir, Freundlich, and BET equations over the entire concentration range (100-3000 g/m3). Finally, the isosteric enthalpies of adsorption were determined. They decreased with increasing surface coverage.

Keywords: Equilibrium Adsorption, Phenol, 4-Chlorophenol, Nonionic Polymeric Resins, Temperature Effect, Aqueous-Solution, Carboxylic-Acids, Sorption, Adsorbents, Organics

Chern, J.M. and Huang, S.N. (1999), Study of nonlinear wave propagation theory. II. Interference phenomena of single-component dye adsorption waves. *Separation Science and Technology*, **34** (10), 1993-2011.

Full Text: [S\Sep Sci Tec34, 1993.pdf](S/Sep%20Sci%20Tec34,%201993.pdf)

Abstract: Yellow acid dye was adsorbed from aqueous solution by granular activated carbon packed in a column. The feed concentration was kept constant for a period of time and then switched to another level to simulate the concentration variation in wastewater treatment processes. The resulting breakthrough curves were experimentally measured and theoretically predicted. Explicit equations and an algorithm were developed based on the wave interference theory to predict the column breakthrough curves of single-component adsorption processes with step change in the feed concentration. The experimental results show that the wave interference theory predicts the column breakthrough curves satisfactorily.

Keywords: Activated Carbon, Aqueous-Solutions, Mass-Transfer, Chromatography, Dyestuffs, Removal, Wave Propagation, Fixed-Bed Dynamics, Dye, Activated Carbon, Adsorption, Wave Interference

? Kocjan, R. and Swieboda, R. (1999), Silica gel treated with a mixture of Aliquat 336 and Acid Alizarin Violet N and its application. *Separation Science and Technology*, **34** (13), 2571-2582.

Full Text: [1999\Sep Sci Tec34, 2571.pdf](1999/Sep%20Sci%20Tec34,%202571.pdf)

Abstract: Acid Alizarin Violet N is strongly extracted by chloroform solutions of Aliquat 336 by an ion-exchange mechanism. Relatively high concentrations of mineral acids are required for its reextraction from the ion pair formed. By impregnation of silica with ion pairs composed of the cation of Aliquat 336 and the anion of the dye, a chelating sorbent for metal ions can be obtained. The sorbent prepared may be successfully used for the separation of mixtures of various metal ions by the column extraction chromatography technique, for additional purification of sodium and potassium salts from the ions of heavy metals, and for the concentration of trace amounts of ions of various metals from aqueous solutions followed by their quantitative determination. The sorbent can be used repeatedly for the sorption and desorption of metal ions (especially those forming less stable complexes with the reagent) after regeneration with solutions of chloric(VII) acid. The effect of hydrophobicity of the chelating reagent on the stability of its ion pair with the tetraalkylammonium cation has been confirmed. Acid Alizarin Violet N forms less stable ion pairs with Aliquat 336 than the more hy drophobic Calmagit.

Keywords: Desorption, Dye, Heavy Metals, Ion Exchange, Metals, Preconcentration, Regeneration, Salts, Sorbent, Sorption

Porras, M. and Talens, F.I. (1999), Removal of 2,4-d from aqueous solutions by micellar flocculation. *Separation Science and Technology*, **34** (13), 2679-2684.

Full Text: [S\Sep Sci Tec34, 2679.pdf](S/Sep%20Sci%20Tec34,%202679.pdf)

Abstract: This paper describes removal of the pesticide 2,4-dichlorophenoxyacetic acid from aqueous solutions by sorption on aggregates formed by flocculation of micelles of the anionic surfactant sodium lauryl sulfate with aluminum sulfate. The micelles aggregate in a single flee containing all the micellar surfactant, and this flee is sufficiently consistent to be removed by filtration. This example illustrates the potential of micellar flocculation as a water treatment technique.

Keywords: Anionic, Surfactant, Separation, Micelle, Pesticide, Separation

Suhasini, I.P., Sriram, G., Asolekar, S.R. and Sureshkumar, G.K. (1999), Nickel biosorption from aqueous systems: Studies on single and multimetal equilibria, kinetics, and recovery. *Separation Science and Technology*, **34** (14), 2761-2779.

Full Text: [S\Sep Sci Tec34, 2761.pdf](S/Sep%20Sci%20Tec34,%202761.pdf)

Abstract: This paper reports studies on the removal of toxic trace metals (nickel separately, and simultaneously with cobalt) from aqueous solutions by employing fungal biosorbents, PFB1 and PFB2, which were developed in our laboratory. The observed maximum equilibrium uptake of nickel on the biosorbent was 214 mg.g-1 (PFB1) and 110 mg.g-1 (PFB2). The average efficiency for nickel removal was 84.5% (PFB1) and 60.8% (PFB2). The equilibrium uptake of nickel followed first-order Langmuir kinetics in the case of PFB1 and second-order Langmuir kinetics in the case of PFB2. Studies on simultaneous removal of cobalt and nickel indicated that the extent of secondary interactions between cobalt and nickel can be quantified by the change in Langmuir equilibrium constants for both metals. A mathematical model based on Fick’s law of diffusion and Langmuir adsorption was developed to simulate the kinetics of nickel removal. The model was able to predict the experimentally observed kinetics well. From the simulations, the diffusivity of nickel in PFB1 was found to be 1.6×10-8 m2.s-1. Desorption studies indicated that it was possible to reuse the biosorbent over three sorption-desorption cycles, and that acidic solutions desorbed better than basic or salt solutions. Among the desorbents studied, HCl and CaCl2, with dt sorption efficiencies equal to 73.2 and 74.1%, respectively, for PFB1 and 70.0 and 63.1%, respectively, for PFB2 at the end of three cycles, were found to be the best desorbents.

Keywords: Biosorption, Nickel, Kinetics, Multimetal Equilibria, Desorption, *Saccharomyces-Cerevisiae*, Heavy-Metals, Biomass, Ions

? Kim, J.S. and Yi, J. (1999), The removal of copper ions from aqueous solutions using silica supports immobilized with 2-hydroxy-5-nonylacetophenoneoxime. *Separation Science and Technology*, **34** (15), 2957-2971.

Full Text: [1999\Sep Sci Tec34, 2957.pdf](1999/Sep%20Sci%20Tec34,%202957.pdf)

Abstract: Silica supports immobilized with 2-hydroxy-5-nonylacetophenoneoxime (LIX 84) were prepared after surface modification by gamma-aminopropyltriethoxysilane. Three types of silica beads and a silica powder were used as supports. Batch and packed-column tests were conducted to investigate the capabilities of the prepared adsorbents to remove copper ions. A comparison of the different silica supports was performed with respect to copper adsorption capacity, copper adsorption rate, and nitrogen content. In addition, studies were carried out for the modified silica beads that showed highest copper ion removal capability among the three silica beads (SB2-L). The extraction rate of the SB2-L increases with solution pH in the range between pH 2 and 4. Stability tests show that the SB2-L is stable under acidic conditions. From regeneration experiments it was found that copper ions which are adsorbed at the surface of the SB2-L were recovered by washing with 0.1 M HNO3 and that the regenerated beads are reversible. The recovery ratios were between 80 and 90%. A breakthrough curve was obtained using modified silica powder (SP-L). The copper recovery ratio for SPL was 74%. The results show that the SP-L prepared is feasible for the extraction of copper ions from aqueous solutions using a fixed-bed reactor.

Keywords: Solvent-Extraction, Separation, Acid, Membranes, Recovery, Exchange, Phase, Resin, Lead

Khalid, N., Ahmad, S., Kiani, S.N. and Ahmed, J. (1999), Removal of mercury from aqueous solutions by adsorption to rice husks. *Separation Science and Technology*, **34** (16), 3139-3153.

Full Text: [S\Sep Sci Tec34, 3139.pdf](S/Sep%20Sci%20Tec34,%203139.pdf)

Abstract: The adsorption of mercury ions from aqueous solutions on rice husk has been investigated as a function of appropriate electrolyte, contact time, concentrations of adsorbent and adsorbate, and temperature. The radiotracer technique was used to determine the distribution of mercury. Maximum adsorption was observed at 0.01 mol.dm-3 acid solutions (HNO3, HCl, H2SO4, and HClO4) using 1.0 g of adsorbent for 1.30×10-3 mol.dm-3 mercury concentration in 5 minutes of equilibration time. Studies show that the adsorption decreases with an increase in the concentrations of all the acids. The adsorption data follow the Freundlich isotherm over the range of 1.3×10-4 to 2.6×10-3 mol.dm-3 mercury concentration. The characteristic Freundlich constants. i.e., 1/n = 0.89±0.05 and A = 208±m.mol.g-1, have been computed for the sorption system. The uptake of mercury increases with a rise in temperature. Thermodynamic parameters, i.e., Delta G degrees, Delta S degrees, and Delta H degrees, have also been calculated for the system. The sorption process was found to be endothermic. Application of the method to the effluents of medium-sized industries showed that 9.9 kg of rice husk was sufficient for their decontamination.

Keywords: Heavy-Metal Ions, Neutron-Activation, Radiotracer Technique, Efficient Removal, Zirconium-Oxide, Trace-Elements, Sea-Water, Behavior, Binding, Preconcentration

Sağ, Y., Ataçoğlu, I. and Kutsal, T. (1999), Simultaneous biosorption of chromium(VI) and copper(II) on *Rhizopus arrhizus* in packed column reactor: Application of the competitive Freundlich model. *Separation Science and Technology*, **34** (16), 3155-3171.

Full Text: [S\Sep Sci Tec34, 3155.pdf](S/Sep%20Sci%20Tec34,%203155.pdf)

Abstract: The simultaneous biosorption of Cr(VI) and Cu(II) on free *Rhizopus arrhizus* in a packed column operated in the continuous mode was investigated and compared to the single metal ion situation. The breakthrough curves were measured as a function of feed flow rate, feed pH, and different combinations of metal ion concentrations in the feed solutions. Column competitive biosorption data were evaluated in terms of the maximum (equilibrium) capacity of the column, the amount of metal loading on the *R. arrhizus* surface, the adsorption yield, and the total adsorption yield. In the single-ion situation the adsorption isotherms were developed for optimum conditions, and it was seen that the adsorption equilibrium data fit the noncompetitive Freundlich model. For the multicomponent adsorption equilibrium the competitive adsorption isotherms were also developed. The competitive Freundlich model for binary metal mixtures represented most the column adsorption equilibrium data of Cr(VI) and Cu(II) on *R. arrhizus* satisfactorily.

Keywords: Immobilized Biomass, Heavy-Metals, Adsorption, Equilibria, Removal, Waste Water, Free Microorganism, Simultaneous Biosorption, Chromium(VI), Copper(II), Packed Column, The Competitive Freundlich Model

Huh, J.K., Song, D.I. and Jeon, Y.W. (2000), Sorption of phenol and alkylphenols from aqueous solution onto organically modified montmorillonite and applications of dual-mode sorption model. *Separation Science and Technology*, **35** (2), 243-259.

Full Text: [S\Sep Sci Tec35, 243.pdf](S/Sep%20Sci%20Tec35,%20243.pdf)

Abstract: Single- and multisolute competitive sorptions were carried out in a batch reactor to investigate the uptake of phenol, 4-methylphenol (MeP), 2,4-dimethylphenol (DMeP), and 4-ethylphenol (EtP) dissolved in water at 25°C onto organically modified montmorillonite. Hexadecyltrimethylammonium (HDTMA) cation was exchanged for metal cations on the montmorillonite to the extent of the cation-exchange capacity (CEC) of the montmorillonite to prepare HDTMA–montmorillonite, changing its surface property from hydrophilic to organophilic. It was observed from the experimental results that the adsorption affinity on HDTMA–montmorillonite was in the order 4-EtP ≈2,4-dMeP 4-MeP phenol. The Langmuir, dual-mode sorption (DS), and Redlich–Peterson (RP) models were used to analyze the single-solute sorption equilibria. The competitive Langmuir model (CLM), competitive dual-mode sorption model (CDSM), and ideal adsorbed solution theory (IAST), coupled with the single-solute models (i.e., Langmuir, DS, and RP models), were used to predict the multisolute competitive sorption equilibria. All the models considered in this work yielded favorable representations of both single- and multisolute sorption behaviors. DSM, CDSM, and IAST coupled with the DSM were found to be other satisfactory models to describe the single- and multisolute sorption of the phenolic compounds onto HDTMA–montmorillonite.

Keywords: Adsorption, Alkylphenols, Applications, Capacity, Cation, Cation Exchange Capacity, Clay, Dissolved, Distributed Reactivity Model, Equilibrium, Hdtma, Hydrophilic, Ideal, Langmuir, Model, Models, Modified, Montmorillonite, Phenol, Phenolic Compounds, Predict, Reactor, Sediments, Smectite, Soils, Sorption, Surface, Thermodynamics, Uptake, Water

Bae, J.H., Song, D.I. and Jeon, Y.W. (2000), Adsorption of anionic dye and surfactant from water onto organomontmorillonite. *Separation Science and Technology*, **35** (3), 353-365.

Full Text: [S\Sep Sci Tec35, 353.pdf](S/Sep%20Sci%20Tec35,%20353.pdf)

Abstract: Single-and bisolute competitive adsorptions were carried out to investigate the adsorption behavior of an anionic dye, Orange II, and an anionic surfactant, dodecylbenzenesulfonate (DBS), from water at 25°C onto montmorillonite treated with hexadecyltrimethylammonium (HDTMA) cation. The monovalent HDTMA cation was exchanged for the metal cations on the montmorillonite to prepare HDTMA-montmorillonite, changing its surface property from hydrophilic to organophilic. Adsorption affinity of DBS on HDTMA-montmorillonite was found to be slightly higher than that of Orange II, probably due to hydrophobic or nonpolar interactions between the long hydrocarbon chains of the HDTMA with an anion. The single-solute adsorption data were fitted to the Langmuir and the Redlich-Peterson (RP) adsorption models. The competitive Langmuir model and the ideal adsorbed solution theory (IAST) coupled with the single-solute adsorption models were used to predict the bisolute competitive adsorption equilibria. Among the models, the IAST coupled with the Langmuir and the RP models for DBS and Orange II, respectively, yielded the most favorable representation of the bisolute competitive adsorption behavior.

Keywords: Organic Pollutants, Sorption, Chromate, Clinoptilolite, Phenols

Hasany, S.M., Saeed, M.M. and Ahmed, M. (2000), Adsorption isotherms and thermodynamic profile of Co(II)—SCN complex uptake on polyurethane foam. *Separation Science and Technology*, **35** (3), 379-394.

Full Text: [S\Sep Sci Tec35, 379.pdf](S/Sep%20Sci%20Tec35,%20379.pdf)

Abstract: Sorption of cobalt(II)–thiocyanate complex onto polyurethane foam (PUF) has been investigated in detail with respect to the equilibrating time between Co(II)-thiocyanate complex in solution and foam, and concentrations of cobalt(II) and sorbent. The sorption was optimized with respect to the composition of electrolyte. Maximum sorption has been achieved from 0.1 M HCl solution containing 0.5 M SCN after 10 minutes of shaking time. The kinetics and thermodynamics of sorption are studied in detail. The kinetics follow a first-order rate equation with the rate constant, *k*, equal to 9.57×10-2 min.-1 The variation of equilibrium constant *K*c with temperature (15–50°C) yields values of Δ*H* = -64±4.6 kJ.mol-1, Δ*S* = -192.6±15.6 J.mol-1.K-1, and Δ*G* = -8.71 kJ.mol-1 at 298 K. The sorption of Co(II)-thiocyanate onto PUF in the presence of common anions and cations has also been measured. The sorption data studied in the concentration range of Co(II) 1.12×10-4 to 1.20×10-3 M follow Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) isotherms. Freundlich parameters 1/*n* = 0.35±0.02 and *A* = 0.85±0.2 mmol.g-1, Langmuir constants *Q* = (5.54±0.12)×10-5 mol.g-1 and *b* = (3.55±0.74)×104 dm3.mol-1 and D–R isotherms β= -0.002999±0.000189 kJ2.mol-2, *C*m = 10.66±0.16×10-4 mol.g-1 and *E* = 12.9±0.4 kJ.mol-1 have been evaluated. The possible sorption mechanism of cobalt–thiocyanate complex onto PUF is also discussed.

Keywords: Adsorption, Adsorption Isotherms, Co(II), Cobalt(II), Composition, Concentration, Data, Equilibrium, Extraction, First Order, Foam, Freundlich, Iridium, Isotherms, Kinetics, Kinetics and Thermodynamics, Langmuir, Mechanism, Polyurethane, Polyurethane Foam, Preconcentration, Rate Constant, Rhodium, Separation, Solution, Sorbent, Sorption, Sorption Mechanism, Temperature, Thermodynamic, Thermodynamics, Thiocyanate, Uptake, Zinc

Bassi, R., Prasher, S.O. and Simpson, B.K. (2000), Removal of selected metal ions from aqueous solutions using chitosan flakes. *Separation Science and Technology*, **35** (4), 547-560.

Full Text: [S\Sep Sci Tec35, 547.pdf](S/Sep%20Sci%20Tec35,%20547.pdf)

Abstract: Commercially available chitosan’s potential in the adsorption of heavy metals like zinc, copper, cadmium, and lead from aqueous solutions under variable physicochemical conditions was investigated. The results obtained from equilibrium and kinetic studies showed that there was significant uptake of these metal ions by chitosan and that chitosan flakes had a maximum sorption capacity for copper ions. The order of metal ion adsorption by chitosan decreased from Cu2+ to Zn2+ as follows: copper < lead < cadmium < zinc. There was a considerable increase in sorption capacity with an increase in chitosan amount, however, this parallelism diminished when the chitosan mass exceeded 0.24 g in 25 mL of metalsolution. The sorption of metal ions from various salt solutions by chitosan flakes was not improved by agitation. The heavy metal uptake by chitosan was found to be pH-dependent, with a maximum at pH 6.0 and 7.0. Sorption equilibrium studies were conducted with a constant sorbent weight and varying initial concentration of metal ions. The experimental data of adsorption from solutions containing metal ions were found to correlate well with the Langmuir isotherm equation.

Keywords: Adsorption, Sorption, Beads, Heavy Metals, Chitosan, Adsorption, Kinetics, Equilibrium

? Suen, S.Y., Tsai, Y.H. and Chen, R.L. (2000), Comparison of breakthrough performance using dye-affinity membrane disks and gel bead columns. *Separation Science and Technology*, **35** (4), 573-591.

Full Text: [2000\Sep Sci Tec35, 573.pdf](2000/Sep%20Sci%20Tec35,%20573.pdf)

Abstract: The breakthrough curve performance of lysozyme and bovine serum albumin to immobilized Cibacron 3GA using different solid supports such as gel beads and membrane disks was investigated in this work. The effects of flow rate and different module designs were also studied. Variation in the flow rate was found to be insignificant for the column process in both nonadsorption and single-protein experiments, but it affected the elution peak height for membrane disks. The peak height decreased with increasing flow rate. As for the effect of different designs, a long column and a wide membrane stack induced a broader breakthrough performance. The performance varied with different solid supports in two-protein experiments. Competitive adsorption occurred for a gel bead column, and the breakthrough curve performance resembled the prediction of combining local equilibrium theory and the extra module effect. The affinity strenth to the gel bead support is in the order lysozyme > BSA dimer > BSA monomer. As for membrane performance, two BSA solutes did not adsorb onto membranes, so as simple separation of lysozyme from BSA, instead of displacement phenomena, was observed.

Keywords: Adsorption, Albumin, Bovine Serum Albumin, Breakthrough, Breakthrough Curve, BSA, Dye-Affinity, Elution, Equilibrium, Flow Rate, Lysozyme, Protein Chromatography, Purification, Separation

Yu, Q.M. and Kaewsarn, P. (2000), Adsorption of Ni2+ from aqueous solutions by pretreated biomass of marine macroalga *Durvillaea potatorum*. *Separation Science and Technology*, **35** (5), 689-701.

Full Text: [S\Sep Sci Tec35, 689.pdf](S/Sep%20Sci%20Tec35,%20689.pdf)

Abstract: Biosorption of heavy metals can be an effective process for the removal and recovery of heavy metal ions from aqueous solutions. The biomass of marine macroalgae has been reported to have high uptake capacities for a number of heavy metal ions. In this paper the adsorption properties of a pretreated biomass of macroalga *Durvillaea potatorum* for Ni2+ were investigated. Adsorption isotherms and kinetics were obtained from batch adsorption experiments. The adsorption capacities were pH dependent and a maximum adsorption capacity was obtained to be 1.13 mmol/g at a pH of about 6. A modified Langmuir model was proposed for the correlation of pH-dependent isotherms. The adsorption process was fast, 90% of adsorption occurred within 25 minutes and equilibrium was reached at around 1 hour. Light metal ions at a concentration of 10 mM did not affect Ni2+ adsorption significantly. Fixed-bed breakthrough curves for Ni2+ removal were also obtained. This study demonstrated that the pretreated biomass of D. potatorum can be used as an effective biosorbent for the treatment of Ni2+-containing wastewater streams.

Keywords: Heavy-Metal Biosorption, Cadmium Adsorption, Removal, Sorption, Water, Algae, Ions, pH, Biosorption of Heavy Metals, Marine Macroalgae, *Durvillaea potatorum*, Wastewater Treatment

Guibal, E., Milot, C. and Roussy, J. (2000), Influence of hydrolysis mechanisms on molybdate sorption isotherms using chitosan. *Separation Science and Technology*, **35** (7), 1021-1038.

Full Text: [S\Sep Sci Tec35, 1021.pdf](S/Sep%20Sci%20Tec35,%201021.pdf)

Abstract: Molybdate sorption using chitosan sorbents has proved to be strictly controlled by the pH of the solution. Sorption isotherms exhibit a sigmoid trend, which has been correlated to the appearance of polynuclear hydrolyzed species, the most favorable species for sorption on chitosan. Sorption capacity exceeds 7 mmol.g-1, which corresponds to a molar ratio between Mo and the amine group significantly higher than 1. The formation of complexes in a pendant fashion and/or the ion-exchange mechanism of polynuclear metal ions are suspected to occur between polynuclear molybdate species and protonated amine groups, though several amine groups can interact with the same polynuclear molybdate group.

Keywords: Chitosan, Molybdate, Hydrolysis, Sorption, Isotherms, pH

? Chern, J.M. and Chang, F.C. (2000), Study of nonlinear wave propagation theory. III. removing heavy metals from wastewater by ion-exchange process. *Separation Science and Technology*, **35** (8), 1099-1116.

Full Text: [2000\Sep Sci Tec35, 1099.pdf](2000/Sep%20Sci%20Tec35,%201099.pdf)

Abstract: The nonlinear wave propagation theory has been applied to predict the breakthrough and regeneration curves of ion-exchange columns for heavy metal removal. Batch experimental tests using IRC-718 cationic resin were conducted to obtain the ion-exchange equilibria of H/Cu and H/Ni systems, and column tests were conducted to obtain the breakthrough and regeneration curves under various operating conditions. The batch experimental results show that the affinity sequence is Cu > H > Ni. The column experimental results show that IRC-718 In H-form is effective for removing copper from synthetic wastewater but not effective for nickel removal. For a copper-rich feed solution, the ion-exchange wave is a self-sharpening wave and its regeneration wave is a nonsharpening one. For a nickel-rich feed solution, the ion-exchange wave is a nonsharpening wave and its regeneration wave is a self-sharpening one. For a copper/nickel mixture feed, nickel gradually appears in the effluent, and a plateau of concentration higher than the feed one is identified. Simple equations based on the nonlinear wave propagation theory have been developed to predict the breakthrough and regeneration curves, and the predicted results are quite comparable with the experimental data.

Keywords: Breakthrough, Chromatography, Dye Adsorption, Dynamics, Heavy Metal, Heavy Metals, Interference, Ion Exchange, Multicomponent, Regeneration, Removal, Wastewater, Wave Propagation

Walker, G.M. and Weatherley, L.R. (2000), Textile wastewater treatment using granular activated carbon adsorption in fixed beds. *Separation Science and Technology*, **35** (9), 1329-1341.

Full Text: [S\Sep Sci Tec35, 1329.pdf](S/Sep%20Sci%20Tec35,%201329.pdf)

Abstract: This work involved the treatment of industrial wastewater from a nylon carpet printing plant which currently receives no treatment and is discharged to sea. As nylon is particularly difficult to dye, acid dyes are required for successful coloration and cause major problems with the plant’s effluent disposal in terms of color removal. Granular activated carbon Filtrasorb 400 was used to treat a ternary solution of acid dyes and the process plant effluent containing the dyes in a fixed-bed column system. Experimental data were correlated using the bed depth service time (BDST) model to previously published work by the authors for single dye adsorption. The results were expressed in terms of the BDST adsorption capacity, in milligrams of adsorbate per gram of adsorbent, and indicated that there was a 12-25% decrease iri adsorption capacity in the ternary system compared to the single component system, This reduction has been attributed to competitive adsorption occurring in the ternary component system. Dye adsorption from the process plant effluent showed an approximate 65% decrease in adsorption capacity compared to the ternary solution system. This has been attributed to interference caused by the other colorless textile effluent pollutants found in the process wastewater. A chemical oxygen demand analysis on these components indicated that the dyes accounted for only 14% of the total oxygen demand.

Keywords: Activated Carbon, Adsorption, Bed Depth Service Time, Bed Depth Service Time Model, Column, Copper, Dye, Dye Adsorption, Dyes, Dyestuffs, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Bed Column, Granular Activated Carbon, Model, Removal, Systems, Textile Process Effluent, Wastewater, Wastewater Treatment, Water

? Suen, S.Y., Chiu, H.C. and Tsai, Y.D. (2000), Polysaccharide-modified poly(ether sulfone) hollow fibers as solid supports for affinity adsorption: Equilibrium adsorption study. *Separation Science and Technology*, **35** (9), 1343-1362.

Full Text: [2000\Sep Sci Tec35, 1343.pdf](2000/Sep%20Sci%20Tec35,%201343.pdf)

Abstract: Poly(ether sulfone) hollow fibers modified with various polysaccharides were used to immobilize Cibacron Blue 3GA for affinity adsorption. Characterization of modified hollow fibers with respect to their activation using ethylene glycol diglycidyl ether, conjugation with polysaccharides, and immobilization with Cibacron Blue 3GA indicates that the surface modification was successfully achieved. This work also studied the adsorption behavior of lysozyme onto immobilized Cibacron Blue 3GA using the polysaccharide-modified fibers as solid supports. The optimal adsorption capacity was observed from the hollow fibers conjugated with hydroxyethyl cellulose or dextran derivative and with high density of immobilized Cibacron Blue 3GA. Moreover, the effect of temperature on lysozyme adsorption was investigated. The results show that the lysozyme-ligand binding on the polysaccharide-modified hollow fibers tends to be endothermic.

Keywords: Adsorption, Adsorption Capacity, Amino-Acids, Behavior, Breakthrough, Capacity, Cellulose, Density, Ethylene, Fibers, Immobilization, Immunoaffinity Chromatography, Immunoglobulin-G, Lysozyme, Membrane, Modification, Modified, Performance, Polysaccharides, Proteins, Purification, Separation, Sulfone, Supports, Surface, Surface Modification, Temperature

Tsai, W.T., Chang, C.Y., Ho, C.Y. and Chen, L.Y. (2000), Adsorption properties and breakthrough model of 1,1-dichforo-1-fluoroethane on granular activated carbon and activated carbon fiber. *Separation Science and Technology*, **35** (10), 1635-1650.

Full Text: [S\Sep Sci Tec35, 1635.pdf](S/Sep%20Sci%20Tec35,%201635.pdf)

Abstract: 1,1-dichloro-1-fluoroethane (HCFC-141b) is current recognized as an excellent substitute for chlorofluorocarbons (e.g., CFC-11 and CFC-113). In the present work fixed-bed adsorption studies were performed on the use of granular activated carbon (GAC) and activated carbon fiber (ACF) for the recovery of HCFC-141b vapor from air. Adsorption equilibria were obtained at 283, 293, 303, and 313 K. Three classic models (Langmuir, Freundlich, and Dubinin-Radushkevich) were applied and their parameter constants were determined by regression analysis. It was found that these isotherms were fitted well by the measured adsorption data, and the determined parameters of isotherm equations were consistent with the physical properties (e.g., specific surface areas and pore volumes) of these carbon adsorbents. It is clear that the performance of adsorbent ACF is significantly better than that of adsorbent GAC in terms of the adsorption capacity and the adsorption rate. A simple two-parameter model, originally introduced by Yoon and Nelson, was adopted to describe the entire breakthrough curves regarding the adsorption of HCFC-141b vapor through carbon columns at 283 K. The results indicate that the calculated breakthrough curves agree well with the corresponding experimental data.

Keywords: HCFC-141b, Granular Activated Carbon, Activated Carbon Fiber, Adsorption

Gupta, V.K., Mohan, D., Sharma, S. and Sharma, M. (2000), Removal of basic dyes (rhodamine B and Methylene blue) from aqueous solutions using bagasse fly ash. *Separation Science and Technology*, **35** (13), 2097-2113.

Full Text: [S\Sep Sci Tec35, 2097.pdf](S/Sep%20Sci%20Tec35,%202097.pdf)

Abstract: Bagasse fly ash, a waste generated in sugar industries in India, has been converted into an inexpensive adsorbent material and utilized for the removal of two basic dyes, rhodamine B and Methylene blue. Results include the effect of pH, adsorbent dose, dye concentration, and presence of surfactant on the removal of rhodamine B and Methylene blue. The adsorption data have been correlated with both Langmuir and Freundlich adsorption models. Thermodynamic parameters obtained indicate the feasibility of the process, and kinetic studies provided the necessary mechanistic information of the removal process.

Keywords: Adsorption, Basic Dyes, Bagasse Fly Ash, Wastewater, Removal, Solid Waste Utilization, Waste-Water, Color Removal, Activated Carbon, Equilibrium Uptake, Sorption Dynamics, Column Operations, Sugar-Industry, Fixed-Bed, Adsorption, Slag

Al-Degs, Y.S., Tutunju, M.F. and Shawabkeh, R.A. (2000), The feasibility of using diatomite and Mn-diatomite for remediation of Pb2+, Cu2+, and Cd2+ from water. *Separation Science and Technology*, **35** (14), 2299-2310.

Full Text: [S\Sep Sci Tec35, 2299.pdf](S/Sep%20Sci%20Tec35,%202299.pdf)

Abstract: Diatomite and manganese-oxide-modified-diatomite (Mn-diatomite) were tested as adsorbents for Pb2+, Cu2+, and Cd2+ removal from water. Impregnating the surface of diatomite with 0.38 g of manganese oxide per gram diatomite shows an increase of 2.4-fold in the surface area of the modified diatomite. The adsorption capacities were 99, 51, and 26 mg/g Mn-diatomite for Pb2+, Cu2+, and Cd2+, respectively, obtained at solution pH 4, while values of 24, 21, and 16 mg/g diatomite were obtained at the same conditions and for the same metals. The obtained adsorption kinetics experimental data display that 95% of the original Pb2+ concentrated was adsorbed by Mn-diatomite within 10 min, while kinetic data for diatomite showed a lower rate for Pb2+ uptake. The filtration quality of diatomite was significantly enhanced with the surface modification by manganese oxide.

Keywords: Adsorption, Metal Ions, Diatomite, Adsorption, Sorption

Biškup, B. and Subotić, B. (2000), Removal of heavy-metal ions from solutions by means of zeolites. II. Thermodynamics of the exchange processes between zinc and lead ions from solutions and sodium ions from zeolite A. *Separation Science and Technology*, **35** (14), 2311-2326.

Full Text: [S\Sep Sci Tec35, 2311.pdf](S/Sep%20Sci%20Tec35,%202311.pdf)

Abstract: Relationships between the corrected selectivity coefficient, K-C(Me) (Me = Zn, Pb), and fraction of the exchanged Me2+ ions in zeolite A, f(Me, Z), were determined from the corresponding exchange isotherms. The exchange isotherms were obtained by measuring the equilibrium concentrations of sodium and Me2+ ions in both the solid and the liquid phase at constant total-ion concentrations and different temperatures in the range from 20 degreesC to 60 degreesC. Thermodynamic equilibrium constants, K-a(Me), calculated from the corresponding Kielland’s plots (lnK(C)(Me) vs. f(Me, Z) plots) were used for the calculation of the appropriate values of standard free energy, ΔG° (Me), standard enthalpy, ΔH° (Me), and standard entropy, ΔS° (Me).

Keywords: Zeolite A, Ion Exchange, Sodium Ions, Zinc Ions, Lead Ions, Exchange Equilibrium, Thermodynamic Data, Waste-Water, Natural Zeolites, Cadmium, Calcium, Ni, 4A

? Kim, Y.H. (2000), Adsorption characteristics of cobalt on ZrO2 and Al2O3 adsorbents in high-temperature water. *Separation Science and Technology*, **35** (14), 2327-2341.

Full Text: [2000\Sep Sci Tec35, 2327.pdf](2000/Sep%20Sci%20Tec35,%202327.pdf)

Abstract: To evaluate adsorbents for the removal of soluble corrosion products, mainly Co-60 under PWR reactor coolant conditions, ZrO2 and Al2O3 were prepared by the sol-gel method and hydrolysis of metal alkoxide, respectively. Their structures were studied by x-ray diffractometer and TG-DTA. The Co2+ adsorption on ZrO2 and Al2O3 in high-temperature water were investigated in a stirred hatch autoclave. The effect of calcination temperature on Co2+ adsorption capacity of ZrO2 and Al2O3, the effect of pH on Co2+ adsorption capacity of Al2O3, the effect of adsorption temperature on adsorption capacity and Co2+ adsorption isotherms were studied. The prepared ZrO2 and Al2O3 adsorbents were found to be stable with tetragonal, monoclinic structures and theta, delta, and alpha phase structures, respectively. The enthalpy changes (DeltaH degrees) due to the adsorption of Co2+ on ZrO2 and Al2O3 were 12.8 and 16.1 kJ/gmol, which suggest that the adsorption is an irreversible endothermic reaction in the experiment temperature (150 similar to 250 degreesC). The Co2+ adsorption capacities of ZrO2 and Al2O3 at 250 degreesC were 0.16 and 0.18 meq Co2+/g adsorbent, respectively. The thermodynamic function of adsorption of DeltaH, DeltaS, DeltaG, and equilibrium constant K-d were calculated. The process of adsorption was established to be endothermic, and chemisorption was stabilized through thermodynamic functions.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Isotherms, Calcination, Capacity, Changes, Characteristics, Chemisorption, Co(II), Co2+, Cobalt, Corrosion, Endothermic, Enthalpy, Equilibrium, Experiment, Function, Functions, Hydrolysis, Isotherms, Metal, pH, Removal, Sol-Gel, Temperature, Thermodynamic, Thermodynamic Functions, Titanium-Oxide, Water

Mondal, K. and Lalvani, S.B. (2000), Modeling of mass transfer controlled adsorption rate based on the Langmuir adsorption isotherm. *Separation Science and Technology*, **35** (16), 2583-2599.

Full Text: [S\Sep Sci Tec35, 2583.pdf](S/Sep%20Sci%20Tec35,%202583.pdf)

Abstract: Adsorption techniques are extensively used in bulk separations, purifications, and physiochemical parameter determinations. Generally, the adsorption models are described for equilibrium conditions. This study investigates the development of a mathematical model which describes the rate of adsorption under the conditions when the dynamic mass transfer is the controlling step. The underlying assumption is that the equilibrium isotherms can be used to describe the adsorption phenomena. A mathematical model for the external mass transfer controlled adsorption rate based on the Langmuir adsorption isotherm was developed and validated using data reported in literature using different adsorbents and adsorbates. In addition, using Freundlich adsorption isotherm, mathematical models for zero, one-half, and first-order were obtained. The various relevant parameters, namely the adsorption capacity, the adsorption energy, and the mass transfer coefficients were evaluated and the extension of the model to energetically heterogeneous surfaces is discussed. In addition, the results obtained from the Langmuir isotherm-based model were compared against the results derived from the mass transfer controlled rate equation based on the Freundlich isotherm.

Keywords: Langmuir, Adsorption, Kinetics, Mass Transfer, Modeling, Ctivated Carbon, Fly-Ash, Kinetics, Surfaces

Sağ, Y., Kaya, A. and Kutsal, T. (2000), Biosorption of lead(II), nickel(II), and copper(II) on *Rhizopus arrhizus* from binary and ternary metal mixtures. *Separation Science and Technology*, **35** (16), 2601-2617.

Full Text: [S\Sep Sci Tec35, 2601.pdf](S/Sep%20Sci%20Tec35,%202601.pdf)

Abstract: The biosorption of three divalent metal ions [Pb(II), Ni(II), and Cu(II)] frequently encountered together in industrial waste waters and in binary and ternary systems was studied using *Rhizopus arrhizus*, a filamentous fungus, in batch stirred reactors. The multimetal biosorption data were evaluated in terms of equilibrium isotherms and adsorption yields. The single-metal equilibrium data were analyzed using the Freundlich adsorption model. The individual Freundlich adsorption constants were determined and used to compare biosorptive capacity of the microorganism for different metal ions. The effects of various combinations of the metal ions on the biosorption capacity of R. arrhizus are discussed and the actions of the synergistic or antagonistic metal ion combinations were determined. For the two-metal adsorption equilibrium, competitive adsorption isotherms have been also developed. The six-parameter empirical Freundlich model, restricted to bicomponent systems, was used successfully to characterize simultaneous biosorption of Pb(II), Ni(II), and Cu(II) ions by R. arrhizus from two-metal systems. The biosorption capacity of Pb(II) in the two binary and one ternary systems, in agreement with the single-metal data, was greater than that of the Ni(II) and Cu(II) ions. The relative capacities were Pb(II) > Ni(II) > Cu(II) at pH 5.0 in single, binary, and ternary systems.

Keywords: Waste Water Treatment, Heavy Metal Ion, Biosorption, *Rhizopus arrhizus*, Multimetal Mixtures, Empirical Freundlich Adsorption Model, Heavy-Metal, Aqueous-Solutions, Fungal Biomass, Adsorption Equilibria, *Penicillium* Biomass, Activated Carbon, Removal, Microalgae, Isotherms, *Ramigera*

Al-Degs, Y., Khraisheh, M.A.M., Allen, S.J. and Ahmad, M.N.A. (2001), Sorption behavior of cationic and anionic dyes from aqueous solution on different types of activated carbons. *Separation Science and Technology*, **36** (1), 91-102.

Full Text: [S\Sep Sci Tec36, 91.pdf](S/Sep%20Sci%20Tec36,%2091.pdf)

Abstract: The effect of dye molecular charges on their adsorption from solution was investigated by using different types of activated carbon adsorbents. Two types of model systems were used representing cationic and anionic dyes. Screening investigations using single point tests were used throughout the study. Cationic dyes, of which Methylene Blue is an example, showed a higher adsorption tendency towards activated carbon over anionic dyes represented by an ate-type reactive compound. of the number of activated carbons tested, only one of the adsorbents showed an exception to this behavior, and a good relation was observed between Methylene Blue capacity and activated carbon performance. The high capacity of cationic dyes in comparison to anionic dyes was also evident in the results obtained by a preliminary kinetic study carried out on the selected systems. Surface net charge of activated carbon and the nature of attractions between the molecules were suggested to be one of the reasons attributed for this behavior.

Keywords: Adsorption, Activated Carbons, Cationic and Anionic Dyes, Spent Bleaching Earth, Reactive Dyes, Organic-Dyes, Adsorption, Removal, Clay

Suzuki, T.M., Tanco, M.L., Tanaka, D.A.P., Matsunaga, H. and Yokoyama, T. (2001), Adsorption characteristics and removal of oxo-anions of arsenic and selenium on the porous polymers loaded with monoclinic hydrous zirconium oxide. *Separation Science and Technology*, **36** (1), 103-111.

Full Text: [S\Sep Sci Tec36, 103.pdf](S/Sep%20Sci%20Tec36,%20103.pdf)

Abstract: Adsorption properties for oxoanions of Se(IV), Se(VI), As(III), As(V), and methyl derivatives of As(V) have been examined by the porous polymer beads loaded with monoclinic hydrous zirconium oxide (Zr-resin). The retention of these ions on the Zr-resin has been analyzed using Langmuir model of adsorption. The equilibrium constants and the capacities for above ions have been determined. The equilibrium constants for monomethyl arsinic acid and dimethyl arsinic acid are similar to that of As(V) but the adsorption capacity depends on the number of methyl groups. As(V) and Se(IV) are effectively retained on the Zr-resin from an aqueous solution of acidic to neutral pH region, whereas As(III) is removed from neutral to alkaline solution. The column system packed with the present Zr-resin can quantitatively remove low levels of As(V) and Se(IV) from aqueous solution.

Keywords: Separation, Oxoanions, Selenium, Arsenic, Zirconium Oxide, Water Treatment, Water

Koch, H.F. and Roundhill, D.M. (2001), Removal of mercury(II) nitrate and other heavy metal ions from aqueous solution by a thiomethylated lignin material. *Separation Science and Technology*, **36** (1), 137-143.

Full Text: [S\Sep Sci Tec36, 137.pdf](S/Sep%20Sci%20Tec36,%20137.pdf)

Abstract: Lignin has been derivatized with methylthioether functional groups in order to reduce its solubility in water. This new chemically modified lignin material has been used as a solid adsorbent for mercury(II) nitrate from aqueous solution. This adsorbent strongly adsorbs nitrate salts of lead(II), cadmium(II), and copper(II) from their solutions in water. The nitrate salts of the trivalent metals chromium(III) and iron(III) are also strongly adsorbed. Sodium(I) nitrate is not adsorbed from aqueous solution and calcium(II) nitrate only moderately so. These metal extraction data are compared with those obtained with methylthioether functionalized calix[4]arenes, which show a similar preference for mercury(II), but a lower preference for lead(II), cadmium(II), and iron(III).

Keywords: Lignin, Mercury, Methylthioether

Hall, C., Wales, D.S. and Keane, M.A. (2001), Copper removal from aquous systems: Biosorption by *Pseudomonas syringae*. *Separation Science and Technology*, **36** (2), 223-240.

Full Text: [S\Sep Sci Tec36, 223.pdf](S/Sep%20Sci%20Tec36,%20223.pdf)

Abstract: The potential of two strains of *Pseudomonas syringae* (Blue and Brown) to remove copper from aqueous solutions has been investigated and assessed against the synthetic Linde LZ-52Y aluminosilicate zeolite. The two bacterial strains were tolerant to copper and were able to grow in media doped with concentrations of up to 1000 ppm. The biosorptive capacity and the mechanism of copper uptake were investigated using ‘active’ and ‘inactive’ species grown in nutrient-rich and complex media. The degree of copper removal by ion exchange with the Y zeolite is reported and compared with that achieved when using the biosorbents under the same treatment conditions. The bacteria were harvested, freeze-dried, and used to adsorb copper under starved and glucose activated conditions. The need to distinguish between ‘bio-uptake’ and the action of complexing agents that may be present are highlighted. The experimental data are fitted to standard Freundlich, BET, and Langmuir adsorption models where the latter yielded both meaningful theoretical maximum adsorption capacities and adsorption affinity coefficients. These values are discussed in terms of the sorbate/sorbent interactions, which are shown to involve a passive mechanism where the majority of the copper attaches to the outer cell wall.

Keywords: Adsorption, Copper Uptake, Langmuir Model, *Pseudomonas* Syringae, Zeolite Y, Biosorption Mechanism, *Saccharomyces-Cerevisiae*, Metal-Ions, Organic-Ligands, Waste-Water, PV Tomato, Adsorption, Resistance, Cells, Accumulation, Langmuir

Notes: highly cited

Ho, Y.S., Ng, J.C.Y. and McKay, G. (2001), Removal of lead(II) from effluents by sorption on peat using second-order kinetics. *Separation Science and Technology*, **36** (2), 241-261.

Full Text: [S\Sep Sci Tec36, 241.pdf](S/Sep%20Sci%20Tec36,%20241.pdf)

Abstract: The kinetics of sorption of lead ion are described by a pseudo-second-order model modified with a new parameter, *t*0, included to account for an initial resistance due to the film boundary layer. Analysis of this model has been carried out at various experimental conditions to study the effect of initial lead ion concentration, peat particle size, solution temperature, and agitation speed in an agitated batch system. The pseudo-second-order rate constant, initial sorption rate, and sorption capacity, together with time constant, *t*0, also have been determined and correlated as a function of the system variables.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Batch System, Capacity, Dyestuffs, Intraparticle Diffusion-Processes, Ion-Exchange, Kinetics, Lead, Mass-Transfer Processes, Peat, Pseudo Second Order, Second Order, Soil Organic-Matter, Sorption, Sphagnum Moss Peat, Transport

Zouboulis, A.I., Matis, K.A. and Lazaridis, N.K. (2001), Removal of metal ions from simulated wastewater by Saccharomyces yeast biomass: Combining biosorption and flotation processes. *Separation Science and Technology*, **36** (3), 349-365.

Full Text: [S\Sep Sci Tec36, 349.pdf](S/Sep%20Sci%20Tec36,%20349.pdf)

Abstract: Queous solutions containing heavy metals can be successfully treated by a combination of biosorption and flotation, in order to remove (or recover) the contained metals. Nonliving biomass of yeast Saccharomyces, which is a solid industrial by-product, was found to be a suitable biosorbent of metal ions (zinc, copper, and nickel). It was found also possible to reuse it after the appropriate desorption treatment. Electrokinetic behavior of biomass as well as elution and multiple-cycles operation were investigated. The dispersed-air flotation technique, which was selected for generation of bubbles, was subsequently examined for solid/liquid separation, In order to hart est the metals-loaded biomass downstream. The main parameters affecting the flotation process were studied, Such as the solution pH, the concentration of notation collector (surfactant), the preliminary biomass modification, and the biomass concentration: The biosorptive flotation method was found promising for remediation applications of wastewaters containing toxic metals.

Keywords: Iosorption, Toxic Metals Removal, Flotation, Yeast, Biomass, Dilute Aqueous-Solutions, Cerevisiae, Separation, Cadmium, Adsorption, Recovery, Cations

Bajpai, S.K. (2001), Removal of hexavalent chromium by adsorption onto fireclay and impregnated fireclay. *Separation Science and Technology*, **36** (3), 399-415.

Full Text: [S\Sep Sci Tec36, 399.pdf](S/Sep%20Sci%20Tec36,%20399.pdf)

Abstract: The removal of hexavalent chromium from its aqueous solutions by adsorption onto fireclay (FC) and impregnated fireclay (IFC) has been studied at 30 degreesC. The adsorption process follows the Langmuir-type adsorption behavior, and the extent of adsorption is more for impregnated fireclay. It is found that electrostatic and H-bonding interactions play a key role in binding the adsorbate molecules to the adsorbent surface. The adsorption process is affected greatly by variation in pH and temperature of the system. Low pH and high temperature favor the adsorption process.

Various kinetic and adsorption parameters such as rate constant for adsorption, intraparticle diffusion rate constant, diffusion coefficient, and adsorption capacity have been evaluated to reflect the experimental findings.

Keywords: Adsorption, Fireclay, Impregnated Fireclay, Hexavalent Chromium, Fly-Ash, Activated Carbon, Aqueous-Solutions, Separation, Effluents

Terzyk, A.P. and Gauden, P.A. (2001), The simple procedure of the calculation of diffusion coefficient for adsorption on spherical and cylindrical adsorbent particles. *Separation Science and Technology*, **36** (4), 513-525.

Full Text: [S\Sep Sci Tec36, 513.pdf](S/Sep%20Sci%20Tec36,%20513.pdf)

Abstract: The simple method of the calculation of the diffusion coefficient of an adsorbed phase (De), based on the analytical solution of Fick’s law of diffusion, for adsorption process is presented. Two shapes of the sorbent granules, i.e., spherical and cylindrical ones, are considered, and the adsorption process is assumed to take place in the Henry’s region of the isotherm. Adopting the method proposed by Korta on the solution of Fick’s law of diffusion, mathematically simple equations are developed to correlate the constant K of the analytical solution: with the value of the relative adsorption as well as with the values of the geometrical parameters of the adsorbent granules. Using these simple equations, one can calculate the values of de and avoid, at the same time, mathematically advanced and time-consuming minimization procedure. Moreover, the procedure is likely to become complicated because of difficult mathematical functions and operations occurring in the equations that describe the, process, for example, Bessel function or the summation from unity to infinity. The presented simplified procedure is adopted for the results of paracetamol adsorption from water solution on two carbons with different shapes of granules, and it is shown that the obtained values of diffusion coefficients are practically the same as those calculated by means of the exact numerical procedure from the analytical solution.

Keywords: Temperature-Dependence, Aqueous-Solutions, Activated Carbon, Neutral pH, Paracetamol

Hasany, S.M., Saeed, M.M. and Ahmed, M. (2001), Sorption of palladium-thiocyanate complexes onto polyurethane foam from aqueous solution using radiotracer technique. *Separation Science and Technology*, **36** (4), 555-570.

Full Text: [S\Sep Sci Tec36, 555.pdf](S/Sep%20Sci%20Tec36,%20555.pdf)

Abstract: The sorption of palladium-thiocyanate complex onto polyurethane foam (PUF) has been investigated and optimized from aqueous solution of different pHs (1–10) and of acids of varied concentration (0.01–0.5 M). Maximum sorption (~ 99%) of palladium (9.4×10−5 M) in the presence of thiocyanate (1.25×10−2 M) ions has been achieved from 0.1 M hydrochloric acid solution within 5 min equilibrating time. The variation of palladium concentration (1.03×10−4 − 1.16×10−3 M) data were subjected to different sorption isotherms.

The data followed both Freundlich and Dubinin-Radushkevich (D-R) isotherms very well, but Langmuir isotherm is not obeyed at very low concentration. The Freundlich parameters 1/*n* = 0.54±0.02 and of *C*m = 35±7 mmol g−1 have been evaluated, whereas D-R isotherm yields β = -0.003277±0.000193 kJ2 mol−2, *X*m = 1.01±0.16 mmol g−1, and of *E* = 12.3±0.35 kJ mol−1. The Langmuir isotherm gives the value of *Q* = 0.27±0.08 mmol g−1 and of *b* = (2.83±0.06)×104 L mol−1. The temperature variation (15–55°C) studies have given values of Δ*H* = -48.9±2.5 kJ mol−1, Δ S = -127.3±8.2 J mol−1 K−1, and of Δ G = -25.2 kJ mol−1 at 298 K. Among the ions tested, thiourea, cyanide, thiosulphate, molybdate, nitrite, and Fe(II) reduce the sorption significantly (31–70%).

Guibal, E., Ruiz, M., Vincent, T., Sastre, A. and Navarro-Mendoza, R. (2001), Platinum and palladium sorption on chitosan derivatives. *Separation Science and Technology*, **36** (5-6), 1017-1040.

Full Text: [S\Sep Sci Tec36, 1017.pdf](S/Sep%20Sci%20Tec36,%201017.pdf)

Abstract: Chitosan is a unique biopolymer due to its cationic properties in acidic solutions. Protonation of the amino groups induces ion-exchange properties that can be used for anion recovery. As this sorbent is soluble in acidic media, it may be necessary to reinforce its chemical stability using a glutaraldehyde cross- linking treatment. Sorption properties are strongly influenced by the pH of the solution and the presence of competitor anions, especially sulfate anions. This competitor effect may be decreased by the grafting of sulfur derivatives on the chitosan backbone using glutaraldehyde as a linker between the polysaccharide chains and the substituent. Several techniques such as FTIR and SEM-EDAX were used for the chemical characterization of chitosan substitution and for the location of PGM sorption on the sorbent. Sorption isotherms and kinetics were investigated and compared for cross-linked materials and substituted polymers, and special attention was given to the influence of competitor anions. The grafting of sulfur compounds increased sorption capacities and decreased the competition of sulfate and chloride anions. While cross-linked materials sorbed platinum and palladium through anion exchange, the grafting of sulfur moities gave chelating functionalities to the ion-exchange resin.

Keywords: Adsorption, Beads, Chitosan, Chitosan Derivatives, Equilibrium, Ion Sorption, Isotherms, Kinetics, Metal-Ion, N-Carboxymethyl Chitosan, Palladium, Platinum, Removal, Sorption, Sulfur Derivatives

Martellaro, P.J., Moore, G.A., Peterson, E.S., Abbott, E.H. and Gorenbain, A.E. (2001), Environmental application of mineral sulfides for removal of gas-phase Hg(0) and aqueous Hg2+. *Separation Science and Technology*, **36** (5-6), 1183-1196.

Full Text: [S\Sep Sci Tec36, 1183.pdf](S/Sep%20Sci%20Tec36,%201183.pdf)

Abstract: Synthesized and commercially available metal sulfides were evaluated for their ability to adsorb elemental and ionic mercury. The coinage group metal sulfides adsorb elemental Hg(0) vapor stoichiometrically. The mechanism of Hg(0) uptake by the copper and gold sulfides is a redox process resulting in the formation of HgS. The mechanism in the case of Ag2S involves redox but there is no HgS formation. The relative rates of Hg(0) adsorption increases in the order CuS > Ag2S > Au2S > Au2S3 corresponding to the metal ion reduction potentials.

The relative rate of Hg(0) adsorption for commercial grade CuS is increased by an activation process which involves making a slurry of the metal sulfide in concentrated oxalic acid followed by drying and then exposure to Hg(0). Relative rates of Hg(0) adsorption were also increased by decreasing the particle size of the metal sulfides. Particle sizes were decreased by synthesis of the metal sulfide in the presence of the particle-size mediating agent CTAB.

The metal sulfides remove ionic mercury from acidic solutions by precipitation with the dissolved sulfide forming HgS. In acidic solution there was no evidence of physical or chemical adsorption between Hg(0) and the metal sulfide. The quantity of ionic Hg2+ removal from aqueous solutions is correlated with the solubility of the metal sulfide. Cu2S was the most soluble metal sulfide tested and thus removed the most ionic mercury from solution by precipitating HgS.

Keywords: Elemental Mercury

Elshani, S., Smart, N.G., Lin, Y.H. and Wai, C.M. (2001), Application of supercritical fluids to the reactive extraction and analysis of toxic heavy metals from environmental matrices-system optimisation. *Separation Science and Technology*, **36** (5-6), 1197-1210.

Full Text: [S\Sep Sci Tec36, 1197.pdf](S/Sep%20Sci%20Tec36,%201197.pdf)

Abstract: The extraction of Cu2+, Pb2+, Cd2+ and Zn2+ utilising supercritical fluid carbon dioxide containing dissolved organophosphorus reagents is shown to be feasible. Using the solubility parameter concept and investigation of a variety of physical parameters favourable extraction conditions of 60°C and 400 atm pressure were determined. Cyanex 302 was found to be the most favourable ligand in terms of stability and ability to complex a range of metal ions. A soil containing substantial amounts of Pb2+ and Cd2+ was studied using SFE and the technique was found to reduce the levels of leachable metal ions to near US EPA regulatory levels.

Keywords: Carbon-Dioxide, Solvent-Extraction, Organophosphorus Reagents, Tributyl-Phosphate, Light Lanthanides, Chelating-Agents, Cyanex-272, Acid, Cobalt(II), Separation

Yu, Q.M. and Kaewsarn, P. (2001), Desorption of Cu2+ from a biosorbent derived from the marine alga *Durvillaea potatorum*. *Separation Science and Technology*, **36** (7), 1495-1507.

Full Text: [S\Sep Sci Tec36, 1495.pdf](S/Sep%20Sci%20Tec36,%201495.pdf)

Abstract: The desorption and recovery of Cu2+ from a biosorbent material derived from marine alga *Durvillaea potatorum* were studied. The biosorbent was a pretreated biomass of *Durvillaea potatorum* with calcium chloride solution and thermal treatment. The Cu2+ was adsorbed onto the biosorbent and then desorbed by various elution solutions. Batch desorption tests established a solution of 0.35 M hydrochloric acid as the most appropriate eluting agent. Fixed-bed desorption recovery curves for Cu2+ were also obtained. In addition, batch desorption recovery curves for Cu2+ were obtained for multiple consecutive adsorption–desorption cycles and the biosorption properties of the biomass for Cu2+ were compared after the fifth cycle to evaluate the stability of the biomass. The use of a mixture of 0.35 M hydrochloric acid and 0.5 M calcium chloride as the eluting agent improved the stability of the biosorbent in the multiple adsorption–desorption cycles. The desorption kinetics were similar to those observed in the ad-sorption process. The desorption process was not significantly affected by temperature.

Keywords: Heavy Metal Biosorption, Marine Algae, *Durvillaea potatorum*, Wastewater Treatment

Kim, J.S., Zhang, L. and Keane, M.A. (2001), Removal of iron from aqueous solutions by ion exchange with Na-Y zeolite. *Separation Science and Technology*, **36** (7), 1509-1525.

Full Text: [S\Sep Sci Tec36, 1509.pdf](S/Sep%20Sci%20Tec36,%201509.pdf)

Abstract: Iron removal from aqueous solutions by batch ion exchange with a solid Na-Y zeolite has been studied. The pH of the solution was monitored continuously during the ion exchange process and the impact of pH on iron hydroxide precipitation and zeolite structural stability is discussed. In the case of the Fe(II)/Na-Y exchange system, the pH of the iron solutions was low enough to prevent the oxidation of Fe(II) and subsequent hydroxide deposition. The Al and Si contents in the solution were negligible, indicating maintenance of structural integrity, while scanning electron microscopic analysis did not reveal any structural breakdown. The ion exchange equilibrium isotherm, constructed at 291±2 K and a total solution positive charge concentration of 0.1 equiv. Dm-3, exhibited a sigmoidal shape and a maximum exchange of 74% of the indigenous sodium content: maximum exchange was essentially independent of exchange temperature. An increase in the initial Fe(II) concentration, in the range 0.005-0.05 mol dm-3, lowered the removal efficiency, but the external Fe(II) was preferred to the indigenous sodium over the entire concentration range. A maximum Fe(II) recovery of 84% from the maximally exchanged zeolite was achieved using 2 mol dm-3 solutions of NaCl as regenerant while the regenerated Na-Y delivered 68% of the original Fe(II) exchange capacity. The Fe(II) recovery was lower from samples exchanged under reflux conditions, while drying the loaded zeolite at 383 K also suppressed the degree of recovery. The treatment of Fe(III) solutions with Na-Y was not feasible due to the acidity associated with the zeolite/salt slurries, which promotes excessive hydroxide deposition and structural disintegration of the zeolite.

Keywords: Na-Y Zeolite, Ion Exchange, Iron Removal, Water Treatment, Metal Co-Cation, Heavy-Metals, Hydrolysis, Equilibria, Cadmium, Lead

Yalcin, S., Apak, R., Hizal, J. and Afsar, H. (2001), Recovery of copper(II) and chromium(III, VI) from electroplating-industry wastewater by ion exchange. *Separation Science and Technology*, **36** (10), 2181-2196.

Full Text: [S\Sep Sci Tec36, 2181.pdf](S/Sep%20Sci%20Tec36,%202181.pdf)

Abstract: Two laboratory-scale separation processes have been developed for the recovery of copper(II) from acidic and cyanide-containing alkaline wastewater of electroplating industries. Acidic bath wastes were treated with Dowex 50X8, a strongly acidic cation-exchange resin, and the retained copper was eluted with H2SO4. The cyanide-containing alkaline bath waste was first oxidized with excessive hypochlorite, then neutralized, and recovered by the use of Amberlite IRC-718 chelating resin. Copper was eluted with H2SO4.

The two different valencies of chromium have been recovered from electroplating-industry wastewater by different separation processes: The predominant valency, Cr(VI), was retained on a strongly basic Dowex 1X8 resin and eluted with a NaCl and NaOH solution. Alternatively, Cr(III), either existing originally in electroplating-industry waste-rinse mixtures or converted from Cr(VI) by reduction with Na2SO3, could be recovered by a weakly acidic Amberlite IRC-50 resin and eluted with a solution containing H2O2 and NaOH. Where plating industry wastes contain high levels of organic contamination, Cr(VT) would be naturally reduced to Cr(III) upon acidification, and it may be more economical to recover all chromium as Cr(III).

Keywords: Copper(II), Chromium (VI), Chromium(III), Recovery, Removal, Electroplating-Industry Wastewater, Ion Exchange, Wastewater Treatment, Tannery Wastes, Heavy-Metal, Removal, Water, Separation, Resins, Preconcentration, Speciation, Effluents, Cr(III)

Lee, H. and Yi, J.H. (2001), Removal of copper ions using functionalized mesoporous silica in aqueous solution. *Separation Science and Technology*, **36** (11), 2433-2448.

Full Text: [S\Sep Sci Tec36, 2433.pdf](S/Sep%20Sci%20Tec36,%202433.pdf)

Abstract: Mesoporous silica was synthesized as a support for the removal of copper ions in aqueous solutions. The Sol-gel method in conjunction with neutral surfactants was used. The remaining surfactants were removed by either the Soxhlet or microwave extraction method. Both extractions resulted in the same pore structure of the mesoporous silicas. However, the microwave extraction method reduced the amount of solvents as well as the time required for removing the remaining organic surfactants. 3-(2-aminoethylamino)propyltrimethoxysilane was functionalized onto the mesoporous silica surface. The functional agent removed copper ions and was bonded to the silica surface via covalent bonding. In addition, it was hydrophilic in nature, which reduced external mass-transfer resistance. The removal capacity of mesoporous silica is about 10 times larger than that of a commercial silica, largely because the mesoporous silica has a larger surface area as well as uniform pore structure. The experimental results and model prediction were in good agreement. The results of sensitivity analysis suggested that the mass transfer rate was so fast that little resistance of external mass transfer and diffusion was possible.

Keywords: Molecular-Sieves, Supports, Monolayers, Beads

Ho, Y.S., Chiang, C.C. and Hsu, Y.C. (2001), Sorption kinetics for dye removal from aqueous solution using activated clay. *Separation Science and Technology*, **36** (11), 2473-2488.

Full Text: [S\Sep Sci Tec36, 2473.pdf](S/Sep%20Sci%20Tec36,%202473.pdf)

Abstract: The kinetics of Basic Red 18 and Acid Blue 9 sorption onto activated clay have been investigated. A batch sorption model, based on the assumption of a pseudo-second order mechanism, has been developed to predict the rate constant of sorption, the equilibrium sorption capacity, and initial sorption rate with the effect of initial dye concentration, activated clay particle size, temperature, and pH value. In addition, an activation energy of sorption has also been determined based on the pseudo-second order rate constants.

Keywords: Activated Clay, Dye, Kinetics, Sorption, Biogas Residual Slurry, Color Removal, Fly-Ash, Waste Slurry, Basic-Dyes, Congo Red, Adsorption, Adsorbent, Water, Equilibrium

Watson, J.H.P., Croudace, I.W., Warwick, P.E., James, P.A.B., Charnock, J.M. and Ellwood, D.C. (2001), Adsorption of radioactive metals by strongly magnetic iron sulfide nanoparticles produced by sulfate-reducing bacteria. *Separation Science and Technology*, **36** (12), 2571-2607.

Full Text: [S\Sep Sci Tec36, 2571.pdf](S/Sep%20Sci%20Tec36,%202571.pdf)

Abstract: The adsorption of a number of radioactive ions from solution by a strongly magnetic iron sulfide material was studied. The material was produced by sulfate-reducing bacteria in a novel bioreactor. The uptake was rapid and loading on the adsorbent was high due to the high surface area of the adsorbent and because many of the ions were chemisorbed. The structural properties were examined with high-resolution imaging and electron diffraction by transmission electron microscopy. The adsorbent surface area was determined to be 400–500 m2/g by adsorption of heavy metals, the magnetic properties, neutron scattering, and transmission electron microscopy. The adsorption of a number of radionuclides was examined at considerably lower concentration than in previous work with these adsorbent materials. A number of ions studied are of interest to the nuclear industry, particularly the pertechnetate ion (TcO4−). 99Tc is a radionuclide thought to determine the long-term environmental impact of the nuclear fuel cycle because of its long half-life and because it occurs normally in the form of the highly soluble pertechnetate ion, which can enter the food chain. This bacteria-generated iron sulfide may provide a suitable matrix for the long-term safe storage of the pertechnetate ion. Also, because of the prevalence of the anaerobic sulfate-reducing bacteria worldwide and, in particular, in sediments, the release of radioactive heavy metals or toxic heavy metals into the environment could be engineered so that they are immobilized by sulfate-reducing bacteria or the adsorbents that they produce and removed from the food chain.

Basu, S. and Malpani, P.R. (2001), Removal of methyl orange and Methylene blue dye from water using colloidal gas aphron: Effect of processes parameters. *Separation Science and Technology*, **36** (13), 2997-3013.

Full Text: [S\Sep Sci Tec36, 2997.pdf](S/Sep%20Sci%20Tec36,%202997.pdf)

Abstract: Colloidal gas aphron (CGA) was used in a flotation column to remove methyl orange and Methylene blue dye from water. The effect of process parameters, i.e., surfactant type and concentration, CGA flow rate, CGA diameter and gas holdup, pH, residence time, and salt concentration, were studied through measurements of percent dye removal. The overall percent removal of methyl orange and Methylene blue was 95-98% for the range of experimental parameters studied. When the surfactant and dye had a similar charge, 40% removal of dye from the water was achieved. This result was unexpected because dye removal by CGA was thought to be an ion-flotation process. However, the oppositely charged dye and surfactant resulted in 98% removal of dye. Based on these observations, the mechanism for dye removal from water using CGA was elucidated. The removal of methyl orange was higher in alkaline conditions when CGA was generated from the cationic surfactant, hexadecyltrimethyl ammonium bromide. The removal of methyl orange is higher in alkaline condition when generated from the anionic surfactant, sodium dodecylbenzene sulfonate. The percent removal of methyl orange and Methylene blue increased with increased flow rate, decreased CGA diameter, and increased gas holdup. The percent removal of dyes increased with increased residence time of CGA in the flotation column. No effects of surfactant concentration above the cmc or salt concentration on the percent removal of dye were observed within the range of experimental parameters.

Keywords: Coflotation, Colloidal Gas Aphron, Dispersions, Dye Removal From Water, Flotation, Flotation, Methylene Blue, Separation, Soil Matrix, Surfactant Solutions, Surfactants, Suspensions, Waste

Márquez-Montesinos, F., Cordero, T., Rodríguez-Mirasol, J. and Rodríguez, J.J. (2001), Powdered activated carbons from Pinus caribaea sawdust. *Separation Science and Technology*, **36** (14), 3191-3206.

Full Text: [S\Sep Sci Tec36, 3191.pdf](S/Sep%20Sci%20Tec36,%203191.pdf)

Abstract: Activated carbons with different porous structures have been prepared from Pinus caribaea sawdust through the Use of CO2 and steam as activating agents. The evolution of the Brunauer- Emmett-Teller (BET) surface area upon activation becomes fairly similar in both cases, and values above 1000 m2, g can be reached at high burn-off levels. Activation with steam produces a more developed porous structure, with a substantially higher contribution of mesoporosity, than does activation with CO2. Increasing the activation temperature leads in both cases to a wide pore-size distribution. The presence of a well-developed mesoporosity makes the resulting products good candidates for adsorbents for water and wastewater treatment. For these purposes, the characteristics of these activated carbons are comparable to those used as commercial adsorbents in those fields, showing in the case of the steam-activated carbons, a somewhat higher mesopore volume than many of the commercial products while maintaining similar surface area values to them. The relative simplicity of the process makes the production of steam-activated carbons a feasible and economically valuable alternative for sawmill wastes

Keywords: Activated Carbon, Activated Carbons, Adsorbents, Adsorption, Agent, Chemical Activation, CO2, H2O, Kraft Lignin, Pore Size Distribution, Porosity, Porous Structure, Sawdust, Sawdust Waste, Steam, Surface Area, Wastewater, ZnCl2

Mcafee, B.J., Gould, W.D., Nadeau, J.C. and da Costa, A.C.A. (2001), Biosorption of metal ions using chitosan, chitin, and biomass of *Rhizopus oryzae*. *Separation Science and Technology*, **36** (14), 3207-3222.

Full Text: [S\Sep Sci Tec36, 3207.pdf](S/Sep%20Sci%20Tec36,%203207.pdf)

Abstract: The biosorptive capacity of dried biomass fungus *Rhizopus oryzae* Went & Prinsen-Geerlings for metal sorption was compared with commercially available sources of chitin, chitosan and chitosan cross-linked with benzoquinone. Initial pH of the metal solution significantly influenced metal uptake capacity. The optimum biomass/solution ratio for metal uptake in all systems was 1 g/L. The highest metal uptake values (137, 108, 58, and 124 mg/g, respectively, for copper, zinc, arsenic, and chromium) were achieved with chitosan (1 g/L, at pH 4) from initial metal concentrations of 400 mg/L. Decreases in mean metal concentrations from a simulated copper/zinc mine effluent were 73%, 14%, and 36% for copper, aluminum, and zinc, respectively, which corresponded to respective metal uptake values of 16, 11, and 21 mg/g. Sorption from a simulated gold mine effluent showed decreases in mean concentrations of aluminum, arsenic, and copper of 85%, 30%, and 92%, respectively, which corresponded to respective metal uptake values of 3.0, 6.0, and 1.6 mg/g. The observed decreases in copper levels to concentrations below 1 mg/L indicate potential for specific polishing applications. At low pH, *R oryzae* biomass was more resistant than was chitosan. Cross-linking with benzoquinone under alkaline conditions conferred stability to the chitosan biomass under low pH, but some reduction in sorption capacity was observed.

Keywords: Biosorption, Chitosan, Copper, Zinc, Chromium, *Rhizopus*, Hexavalent Chromium, Uranium Biosorption, Fungal Biomass, Heavy-Metals, *R-arrhizus*, Removal, Copper, Adsorption, Mechanism, Seaweed

Stefanova, R.Y. (2001), Metal ion removal by modified polyacrylonitrile sorbent preliminarily converted into an inner salt. *Separation Science and Technology*, **36** (15), 3411-3426.

Full Text: [S\Sep Sci Tec36, 3411.pdf](S/Sep%20Sci%20Tec36,%203411.pdf)

Abstract: Metal ion removal from acidic solutions with a high electrolyte concentration was completed through a modified polyacrylonitrile sorbent. The effects of the initial ion concentration, pH, the ionic strength, and anionic influence on the sorption behavior of the modified polymer were investigated. The distribution coefficient values for metal ions of various initial concentrations at 0.1 mol/L ionic strength increased in the following order: Mg2+ < Co2+ < Ni2+ < Zn2+ + Cd2+ < Cu2+ < Pb2+. The change of the ionic strength of the solution exerts a slight influence on the removal of copper, lead, and cadmium ions from aqueous solutions. Competition sorption studies were conducted at pH 4, ionic strength 0.5 mol/L, and with competing metal ions added at equivalent initial concentrations in the 2-component systems. Complete elution of metal ions from a loaded modified polymer was achieved with a nitric acid solution (pH 1.0–1.5) or by a subsequent treatment with 3% NH4OH solution. The modified polymer has a high selectivity toward lead and copper ions and could be used to remove and separate different amounts of these elements from metal-bearing solutions and industrial wastewater with a high electrolyte concentration.

Büyüktuncel, E., Tuncel, A., Genç, Ö. and Denizli, A. (2001), Selective removal of lead ions by polyethylene glycol methacrylate gel beads carrying Cibacron Blue F3GA. *Separation Science and Technology*, **36** (15), 3427-3438.

Full Text: [S\Sep Sci Tec36, 3427.pdf](S/Sep%20Sci%20Tec36,%203427.pdf)

Abstract: Polyethylene glycol methacrylate (PEG-MA) gel beads carrying Cibacron Blue F3GA (42.6 μmol/g polymer) were prepared for the removal of Pb(II), Cu(II), and Cd(II) from aqueous solutions that contained different amounts of these ions (10–100 mg/L) and at different pH values (2.0–7.0). Adsorption rates were high, and adsorption equilibria were reached within 20 minutes. Adsorption of these metal ions on the unmodified PEG-MA gel beads was zero. The maximum adsorptions of heavy metal ions onto the Cibacron Blue F3GA–attached microbeads from single solutions were 23.3 mg/g (112.4 μmol/g) for Pb(II), 12.4 mg/g (110.3 μmol/g) for Cd(II), and 7.0 mg/g (110.2 μmol/g) for Cu(II). When the heavy metal ions competed (in the case of the adsorption from their mixture) the amounts of adsorption were 14.96 mg/g (72.2 μmol/g) for Pb(II), 0.72 mg/g (11.3 μmol/g) for Cu(II), and 1.10 mg/g (9.8 μmol/g) for Cd(II). Under competitive conditions, the system showed high selectivity for Pb(II) ions. The formation constants of Cibacron Blue F3GA–metal ion complexes were investigated through the application of the Ružić method. The calculated values of formation constants were 8.5×105 L/mol1 for Pb(II) dye, 2.5×105 L/mol for Cu(II) dye, and 8.2×104 L/mol for the Cd(II) dye complex. PEG-MA gel beads carrying Cibacron Blue F3GA can be regenerated through washing with a solution of nitric acid (0.1 mol/L). The maximum regeneration value was as high as 98.5%. These PEG-MA gel beads are suitable for more than 3 adsorption-desorption cycles without experiencing considerable loss of adsorption capacity.

Chen, J.P. and Wang, L. (2001), Characterization of a Ca-alginate based ion-exchange resin and its applications in lead, copper, and zinc removal. *Separation Science and Technology*, **36** (16), 3617-3637.

Full Text: [S\Sep Sci Tec36, 3617.pdf](S/Sep%20Sci%20Tec36,%203617.pdf)

Abstract: Characterization of a novel ca-alginate based ion-exchange resin and its application in metal removal were investigated. The metal removal percentages increased from almost 0 to nearly 100% for metal concentrations < 0.1 mmol/L at pH 1.2 to 4, and a plateau was established at pH > 4. The removal percentages were in the following order: Pb2+ > Cu2+ > Zn2+ at pH < 4. Lower initial concentrations and ionic strengths slightly enhanced the removal percentage. The maximum metal removal capacities (qmax) were 2.01 and 2.04 mmol/g for lead and copper, respectively, which are much higher than activated carbons and other reported biosorbents. Competitive effects were important for zinc removal, but less significant for lead and copper uptake. Organic chemical leaching from the resin was negligible.

The single- and multiple-species metal ions were removed completely within approximately 90 and 130 minutes, respectively. The lead removal became much faster when its concentration was decreased and in the absence of other metal ions. Presence of competitive metal ions significantly reduced the metal uptake rate. Removal process kinetics were controlled by the mass transfer, while the local equilibrium followed an ion-exchange relationship.

Keywords: Ca-Alginate Based Ion-Exchange Resin, Metal Removal, Equilibrium, Kinetics, Competitive Effect, Aqueous-Solutions, Calcium Alginate, Activated Carbon, Marine-Algae, Metal-Ions, Z-Ramigera, Biosorption, Adsorption, Biomass, Recovery

Karabulut, S., Karabakan, A., Denizli, A. and Yurum, Y. (2001), Cadmium(II) and mercury(II) removal from aquatic solutions with low-rank Turkish coal. *Separation Science and Technology*, **36** (16), 3657-3671.

Full Text: [S\Sep Sci Tec36, 3657.pdf](S/Sep%20Sci%20Tec36,%203657.pdf)

Abstract: Removal of heavy metal ions from aqueous solutions containing low-to-moderate levels of contamination using Turkish Beypazari low-rank coal was investigated. Carboxylic acid and phenolic hydroxyl functional groups on the coal surface were the adsorption sites for heavy metal ions via the ion-exchange mechanism. The equilibrium pH of the coal-solution mixture was the principal factor controlling the extent of removal of Cd(II) and Hg(II) from aqueous solutions. The optimum pH was 4.0, and the adsorption reached equilibrium in 30 minutes. The maximum adsorption capacities of the metal ions from their single solutions were 1.55 mg for Hg(II) and 1.42 mg for Cd(II) per g of coal. Based on a weight uptake by coal, Hg(II) was found to have a greater affinity for the adsorption sites than does Cd(II). The same behavior was observed during competitive adsorption, that is, adsorption from binary solutions. The adsorption phenomena followed a typical Langmuir isotherm. The maximum adsorption capacities (qm) were calculated as 2.03 mg/g and 1.70 mg/g for Hg(II) and Cd(II), respectively. The K-d values were 8.2 mg/L for Cd(II) and 9.8 mg/L for Hg(II). The use of low-rank coal was considerably effective in removing Hg(II) and Cd(II) from aqueous solutions. High amounts of adsorbed metal ions could be desorbed (up to 90%) with 25 mmol/L EDTA. Low-rank Turkish coals are suitable for use in more than 10 cycles without experiencing significant loss of adsorption capacity.

Keywords: Turkish Low-Rank Coal, Heavy Metal Ions, Adsorption, Metal Removal, Metal-Ions, Aqueous-Solution, Amidoxime Groups, Adsorption, Sorption, Recovery, Copper, Water, Preconcentration, Separation

Leyva-Ramos, R., Bernal-Jacome, L.A., Guerrero-Coronado, R.M. and Fuentes-Rubio, L. (2001), Competitive adsorption of Cd(II) and Zn(II) from aqueous solution onto activated carbon. *Separation Science and Technology*, **36** (16), 3673-3687.

Full Text: [S\Sep Sci Tec36, 3673.pdf](S/Sep%20Sci%20Tec36,%203673.pdf)

Abstract: Single and simultaneous Cd(II) and Zn(II) adsorption isotherms from aqueous solution onto activated carbon were determined experimentally. Single isotherms for these ions fit the Langmuir isotherm well, and the maximum molar uptake of Zn(II) aver-aged 1.6 times that of Cd(II). The simultaneous adsorption isotherms also fit the bisolute Langmuir isotherm modified with an interaction factor. Adsorption of each single ion was reduced by the presence of the other ion, which competed for some of the same active sites. The Zn(II) isotherm proved to be more sensitive to the presence of the competing ion than did the Cd(II) isotherm.

Keywords: Activated Carbon, Cadmium, Competitive Adsorption, Single Adsorption, Zinc, Cd, Biosorption, Sorption, Single, Zn, Langmuir, Cadmium, Copper, Metal, Cu

Lu, Y.J., Wang, Y.S. and Zhu, X.H. (2001), The removal of bromophenol blue from water by solvent sublation. *Separation Science and Technology*, **36** (16), 3763-3776.

Full Text: [S\Sep Sci Tec36, 3763.pdf](S/Sep%20Sci%20Tec36,%203763.pdf)

Abstract: Bromophenol blue (BB), an anionic dye, was removed from aqueous solution by solvent sublation of a BB hexadecyl-pyridium-chloride (HPC) complex (sublate) into isopentanol. A stoichiometric amount of surfactant (surfactant-dye = 2: 1) was the most effective compound for the removal, with over 95% BB removed from the aqueous solution in 10 minutes by solvent sublation. The removal rate was somewhat enhanced by high airflow rates and was also more or less independent of the organic solvent volume floated on the top of the aqueous column. The effects of electrolytes (e.g. KCl), nonhydrophobic organic compounds (e.g. ethanol), and pH of the solution upon the process were studied. The infrared spectra showed that the interaction between sublate and organic solvent was weak. The comparison of air stripping and solvent extraction with the solvent-sublation process was made. The solvent-sublation process was consistent with first order kinetics. A characteristic parameter, apparent activation energy of attachment of the sublate to bubbles, was determined as 4.77 KJ/mol.

Keywords: Adsorbing Colloid Flotation, Volatile Organic-Compounds, Trace-Element Separation, Refractory Organics, Transport Extraction, Aeration, Preconcentration, Atmosphere, Kinetics, Emission

Matis, K.A. and Zouboulis, A.I. (2001), Flotation techniques in water technology for metals recovery: The impact of speciation. *Separation Science and Technology*, **36** (16), 3777-3800.

Full Text: [S\Sep Sci Tec36, 3777.pdf](S/Sep%20Sci%20Tec36,%203777.pdf)

Abstract: Toxic metals exist in the effluents of many industrial operations. The impact of chemical speciation was stressed during various flotation applications for metal separation from the effluent. Examples of recent investigations include the removal of arsenic ions by iron oxides, speciation studies of chromium ions, the selective separation of molybdate anions (and verification of extant phosphate, arsenate, and silicate impurities), the recovery of tungstates, the biosorption of metals (i.e., the selective removal of copper), the use of pyrite and other solid wastes as adsorbents, and the classical case of mixed sulfide mineral flotation (pyrite oxidation, use of surface complexation modeling, etc.). Thermodynamic equilibrium diagrams and software packages were employed to interpret the removal mechanism involved.

Saito, T. and Torii, S. (2002), Microcapsule for adsorption and recovery of cadmium(II) ion. *Separation Science and Technology*, **37** (1), 77-87.

Full Text: [S\Sep Sci Tec37, 77.pdf](S/Sep%20Sci%20Tec37,%2077.pdf)

Abstract: A chelate resin that adsorbed bathocuproinedisulfonate ion on an anion exchange resin was synthesized, and then polystyrene microcapsules containing the chelate resin were prepared by interfacial polymerization with W/O/W emulsions. The adsorption behavior of metallic ions such as Cu2+, Cd2+, Co2+, Ni2+, and Zn2+ ions into the microcapsules obtained then was examined at 25degreesC. The adsorption rate of the Cd2+ ion to the microcapsules was over 9 times more than that of the Cu2+, Co2+, Ni2+, and Zn2+ ions. None of the metallic complexes trapped in the microcapsules were affected by the outside environment such as pH, and the Cd2+ ion remained unaffected in the microcapsules even in a highly acidic solution.

Keywords: Cadmium Ion, Microcapsule, Chelate Resin, Adsorbent, Bathocuproinedisulfonic Acid Disodium Salt

Titus, E., Kalkar, A.K. and Gaikar, V.G. (2002), Adsorption of anilines and cresols on NaX and different cation exchanged zeolites (equilibrium, kinetic, and IR investigations). *Separation Science and Technology*, **37** (1), 105-125.

Full Text: [S\Sep Sci Tec37, 105.pdf](S/Sep%20Sci%20Tec37,%20105.pdf)

Abstract: The equilibrium isotherms and the rate of adsorption have been measured for anilines and cresols on different zeolites by the usual gravimetric method using Microforce balance system. The adsorption isotherms of different anilines on NaX and different exchanged zeolites were fitted in Langmuir, Nitta, and virial isotherms and various adsorption parameters were calculated. Diffusivity studies show that the rate of adsorption depends on the diameter of the molecule and the channel diameter. Diffusivities were observed to be concentration-independent and closely consistent with the Arrhenius relationship with activation energies as high as 96.6 kJ/mol. The infrared analysis of the induced bands of anilines and cresols on zeolites shows some additional bands related to N-H and O-H in anilines and cresols. The shift in these bands with respect to aniline and cresol spectra indicates the specific adsorption. Major shifts of the peaks are due to the lone pair-Lewis acid site interaction.

Juang, R.S. and Shiau, J.Y. (2002), Removal of acetone and methanol from gaseous streams in a hollow fiber absorber. *Separation Science and Technology*, **37** (2), 261-277.

Full Text: [S\Sep Sci Tec37, 261.pdf](S/Sep%20Sci%20Tec37,%20261.pdf)

Abstract: Absorption removal of acetone and methanol from N2 gas streams with liquid silicone oil was investigated in microporous hollow fiber modules. The gas flowed into the tube and silicone oil was flowed in the shell. Inlet concentrations of acetone and methanol were 1600 and 500 ppmv, respectively. All experiments were performed as a function of gas linear velocity (2.1 - 10.4 cm/sec), liquid linear velocity (0.6-5.8 cm/sec), and the operation time (10-60 min). The overall mass-transfer coefficients based on the gas phase were calculated and compared with the experimental results. The mass transfer mechanism was discussed and the height of a transfer unit in this device was finally determined.

Keywords: Absorption Removal, Acetone, Hollow Fiber Module, Mass Transfer, Methanol, Silicone Oil, Membrane-Based Absorption, Solvent-Extraction, Mass-Transfer, Gas Streams, Vocs, Permeation, Modules, Water, Air

Sağ, Y., Akçael, B. and Kütsal, T. (2002), Ternary biosorption equilibria of chromium(VI), copper(II), and cadmium(II) on *Rhizopus arrhizus*. *Separation Science and Technology*, **37** (2), 279-309.

Full Text: [S\Sep Sci Tec37, 279.pdf](S/Sep%20Sci%20Tec37,%20279.pdf)

Abstract: A process of competitive biosorption of Cr(VI), Cu(II), and Cd(II) ions to *Rhizopus arrhizus* from ternary mixtures was described. Three-dimensional biosorption isotherm surfaces were used to evaluate the three-metal biosorption system performance. Triangular equilibrium diagrams, which could incorporate all the experimental data of the ternary system, were also constructed. The multimetal biosorption equilibria were described by the multicomponent Langmuir and Freundlich models. of the two models examined, the Langmuir-type model showed the best fit for the three-metal biosorption data, whereas the Freundlich-type multicomponent model did not adequately describe the biosorption results of Cr(VI) ions on R. arrhizus from ternary mixtures. The multimetal biosorption results indicated that Cr(VI) and Cu(II) significantly inhibited the biosorption of Cd(II). The Cr(VI)+Cu(II)+Cd(II) combination showed synergistic interaction on the biosorption of Cr(VI) ions.

Keywords: Biosorption, Cadmium(II), Chromium(VI), Copper(II), Multicomponent Adsorption Models, *Rhizopus arrhizus*, Three-Metal System, Binary Metal Mixtures, *R-arrhizus*, Systems, Adsorption, Biosorbent, Models, Ions, Vulgaris, Fe(III), Removal

Banat, F., Al-Asheh, S. and Mohai, F. (2002), Multi-metal sorption by spent animal bones. *Separation Science and Technology*, **37** (2), 311-327.

Full Text: [S\Sep Sci Tec37, 311.pdf](S/Sep%20Sci%20Tec37,%20311.pdf)

Abstract: The multi-component metal sorption by animal bones was examined using single, binary, and ternary systems composed of Cu2+ Zn2+, and Ni2+. Four isotherm models, namely Freundlich, Langmuir, Sips, and Ideal Adsorption Solution Theory (IAST) were used in this study to predict the equilibrium uptake for Cu2+, Zn2+, and Ni2+ in binary solutions using the single adsorption constants, obtained by the single isotherm experimental data. Sorption was suppressed by the presence of other metal ions in the binary or ternary sorption processes.

The Langmuir, Freundlich, and Sips isotherm models were found to represent the experimental data of a single isotherm sorption process. Whereas, the predictions of binary sorption isotherm systems, Cu2+-Ni2+, Zn2+-Cu2+, Ni2+-Zn2+, showed good agreement with experimental data when using all models except Langmuir.

Keywords: Animal Bones, Copper, Multi-Metal, Nickel, Sorption, Zinc, Ion-Exchange, Adsorption, Biosorption, Equilibria, Removal

Ahmad, S., Khalid, N. and Daud, M. (2002), Adsorption studies of lead on lateritic minerals from aqueous media. *Separation Science and Technology*, **37** (2), 343-362.

Full Text: [S\Sep Sci Tec37, 343.pdf](S/Sep%20Sci%20Tec37,%20343.pdf)

Abstract: Minerals produced by lateritic weathering have been exploited to evaluate their potential for the decontamination of lead ions from aqueous solutions and for understanding decontamination mechanism in nature. Various physico-chemical parameters such as selection of appropriate electrolyte, equilibration time, amount of adsorbent, concentration of adsorbate, effect of diverse ions and temperature were studied in order to simulate the best conditions in which the particular material could be used as an adsorbent. Maximum adsorption was observed at 0.005 mol L-1 acid solutions (HNO3, HCl, and HClO4) using 0.2 g of adsorbent for 4.82×10-5 mol L-1 lead concentration in five minutes equilibration time, Studies show that the adsorption of lead decreases with the increase in the concentrations of all the acids. The adsorption data follows the Freundlich isotherm over the range of 2.41×10-6-9.65×10-4 mol L-1 lead concentration. The characteristic Freundlich constants, i.e., 1/n = 0.42±0.02 and K = 0.57±0.01 mmol g-1 have been computed for the sorption system. The sorption mean free energy from the Dubinin-Radushkevich isotherm is 13.96±0.74 kJ mol-1 indicating an ion-exchange mechanism of chemisorption. The uptake of lead increases with (lie rise in temperature (278-323K). Thermodynamic quantities, i.e., DeltaG, DeltaS, and DeltaH also have been calculated for the system. The sorption process was found to be endothermic.

Keywords: Adsorption, Lateritic Minerals, Lead, Removal, Atomic-Absorption Spectrometry, Heavy-Metal Ions, Trace-Metals, Sea-Water, Preconcentration, Cadmium, Sorption, Goethite, Elements, Seawater

Zouboulis, A.I., Lazaridis, N.K. and Grohmann, A. (2002), Toxic metals removal from waste waters by upflow filtration with floating filter medium. I. The case of zinc. *Separation Science and Technology*, **37** (2), 403-416.

Full Text: [S\Sep Sci Tec37, 403.pdf](S/Sep%20Sci%20Tec37,%20403.pdf)

Abstract: The effectiveness of upflow filtration to remove zinc ions was studied in the present paper. Zinc ions were precipitated by employing either the conventional hydroxide route or the carbonate-enhanced route (addition of NaOH plus Na2CO3). Upflow column filtration with synthetic buoyant filter media was used for the subsequent solid-liquid separation of toxic metal precipitates. The experiments were conducted in semi-batch recirculated mode, using a pilot-scale upflow filtration column. The examined parameters were the necessary recirculation treatment time (3-4 hr) for the remaining concentrations of toxic metal to achieve the legislative limits (below 1 mg/L), the pH value (around 9.0), the initial concentration of the studied metal (10-50 mg/L). and the linear velocity of the waste solution under treatment within the column (10-65 m/hr). Under optimized conditions, the high efficiency and simplicity of the studied method for the removal of metal was demonstrated.

Keywords: Floating Filter Medium, Precipitation, Upflow Filtration, Zinc Removal, Sand Filter

Al-Jabari, M.E., Mousa, H. and Al-Khateeb, I. (2002), Kinetics of deposition of carbon particles on plastic spheres. *Separation Science and Technology*, **37** (2), 431-449.

Full Text: [S\Sep Sci Tec37, 431.pdf](S/Sep%20Sci%20Tec37,%20431.pdf)

Abstract: The kinetics of particle deposition onto the surface of spherical collector particles suspended in a stirred batch vessel was investigated. The study considered monodisperse particle and monodisperse spherical collector particles, The Langmuir model for the deposition process was presented with model parametric study as well as model limiting, cases of Smoluchowski analysis and equilibrium state. A method for obtaining the model parameters from model limiting cases was demonstrated. The model was experimentally tested by studying the deposition of small carbon particles onto plastic spheres. This is useful in the de-inking process of waste paper using plastic spheres. The obtained deposition curves are fitted to the model. The estimated parameters from model limiting cases are in agreement with those, obtained from the full deposition curves fitted to Langmuir kinetics. The maximum number of carbon particles that can deposit oil plastic particles is estimated theoretically from geometrical analysis. The estimated value is very close to that determined from the model.

Keywords: Orthokinetic Coalescence Efficiency, Simple Shear-Flow, In-Oil Emulsions, Stability

Serrano, J., Granados, F., Bertin, V. and Bulbulian, S. (2002), Speciation of some 235U fission products in nitrate solution and their sorption behavior on thermally treated hydrotalcites. *Separation Science and Technology*, **37** (2), 329-341.

Full Text: [S\Sep Sci Tec37, 329.pdf](S/Sep%20Sci%20Tec37,%20329.pdf)

Abstract: 235U fission products and their daughter radioisotopes sorption behavior on calcined hydrotalcite were studied through batch and dynamic experiments. Electrophoresis showed that 99Mo and 99mTc (the decay product of 99Mo) were present in the solution mainly as anions. 103Ru was found as neutral and anionic species and 131I formed an insoluble compound. 132Te was present only as a neutral species. It was found that under the utilized experimental conditions, 99Mo presented the highest sorption value on calcined hydrotalcite, followed by 99mTc, 131I, 103Ru, and 132Te. Cations such as 140Ba2+ and 140La3+ were also retained by calcined hydrotalcite although in smaller proportions. It was also found that a very high concentration of NO3-, anions in the solution decreased the sorption of the radioactive anions on calcined hydrotalcite.

Keywords: Anion-Exchange, Removal

San Miguel, G., Fowler, G.D. and Sollars, C.J. (2002), Adsorption of organic compounds from solution by activated carbons produced from waste tyre rubber. *Separation Science and Technology*, **37** (3), 663-676.

Full Text: [S\Sep Sci Tec37, 663.pdf](S/Sep%20Sci%20Tec37,%20663.pdf)

Abstract: Activated carbons produced from waste tyre rubber have shown exceptional characteristics for the adsorption of organic species from solution. Adsorption capacities were found to be dependent primarily on the degree of activation and the molecular size of the adsorbate compound. For the purpose of this work, a series of activated carbons were produced by steam activation of waste tyre rubber at 925degreesC over a period of 80-640 min. The resulting carbons were investigated for their porosity, using nitrogen gas adsorption, and for their aqueous adsorption characteristics, using phenol, Methylene blue, and textile dyes Turquoise H-A and Red H-E2B. Two widely used commercial adsorbents were also tested for comparative purposes. Aqueous adsorption data were modeled to the Langmuir equation in order to determine the adsorption capacities (X-m) and affinity parameters (b) associated with each sample. Rubber-derived carbons proved superior to the commercial adsorbents for the removal of medium and large molecular weight compounds from solution, which was attributed to their extensive total micropore volume and external surface area.

Keywords: Activated Carbon, Adsorption, Dyes, Pyrolysis, Tyres, Vacuum Pyrolysis, Scrap Tires, Chars, Oils, Air

Pagnanelli, F., Esposito, A., Toro, L. and Vegliò, F. (2002), Copper and cadmium biosorption onto *Sphaerotilus natans*: Application and discrimination of commonly used adsorption models. *Separation Science and Technology*, **37** (3), 677-699.

Full Text: [S\Sep Sci Tec37, 677.pdf](S/Sep%20Sci%20Tec37,%20677.pdf)

Abstract: In this paper, the experimental data of copper and cadmium biosorption onto *Sphaerotilus natans* obtained under different operating conditions of pH (3 divided by 6 units) and biomass concentration (0.5 divided by 2 g/L) were reported. These experimental data, showing the good separative performances of S. natans and the strong effect of the selected operative factors, were represented by three different empirical models: Langmuir. Freundlich, and Redlich-Peterson isotherms. A statistical representation of the characteristic model parameters (parameter standard deviation and regression coefficient) along with a model discrimination analysis (model residual variance, F-test and residual analysis) were proposed in order to suggest a standardized procedure for treating the biosorption data.

Keywords: Heavy Metal Biosorption, Langmuir and Freundlich Isotherms, Model Discrimination, Iron(III)-Cyanide Complex Anions, *Rhizopus-arrhizus*, Aqueous-Solutions, Arthrobacter sp, Ion-Exchange, Metal-Ions, Equilibrium, Surfaces, Biomass, Isotherms

Chah, S., Kim, J.S. and Yi, J.H. (2002), Separation of zinc ions from aqueous solutions using modified silica impregnated with CYANEX 272. *Separation Science and Technology*, **37** (3), 701-716.

Full Text: [S\Sep Sci Tec37, 701.pdf](S/Sep%20Sci%20Tec37,%20701.pdf)

Abstract: Di-2, 4, 4-trimethylpentyl phosphinic acid (CYANEX 272) was immobilized on a silica surface after it was treated with dichlorodimethylsilane and chlorotripropylsilane. The resulting adsorbent prepared showed an excellent selectivity for zinc ion in aqueous solutions and was stable under acidic conditions. Change in surface and pore structure were investigated by means of FT-IR and BET. respectively. The metal ion adsorption capacity order of the resulting adsorbent (silica powder impregnated with CYANEX 272 after silanization of dichlorodimethylsilane, SPDC) was Zn2+ > Co2+ > Cu2+ > Cd2+ > Ni2+ in the pH range of 2-5. Fixed bed tests were conducted in order to evaluate the efficiency of removal of metal ions using the SPDC, and a breakthrough curve was obtained for the zinc solution. The adsorbed zinc ions could be recovered by treatment with 0.1 M HCl, which permits cyclic use after regeneration.

Keywords: CYANEX 272, Cyclic Use, Selectivity, Sulfate-Solutions, Copper Ions, Extraction, Adsorption, Adsorbents, Recovery, Cadmium, Removal, Zn(II), Resins

Ozkara, S., Yavuz, H., Patir, S., Arıca, M.Y. and Denizli, A. (2002), Separation of human-immunoglobulin-G from human plasma with L-histidine immobilized pseudo-specific bioaffinity adsorbents. *Separation Science and Technology*, **37** (3), 717-731.

Full Text: [S\Sep Sci Tec37, 717.pdf](S/Sep%20Sci%20Tec37,%20717.pdf)

Abstract: The pseudo-biospecific affinity ligand L-histidine immobilized poly(2-hydroxyethylmethacrylate) (PHEMA) in spherical form (100-150 mum in diameter) was used for the affinity chromatographic separation of human-immunoglobulin-G (HIgG) from aqueous solutions and human plasma. The PHEMA adsorbents were prepared by a radical suspension polymerization technique. Reactive aminoacid-ligand L-histidine was then immobilized by covalent binding onto these adsorbents. Elemental analysis of immobilized L-histidine for nitrogen was estimated as 62.3 mg L-histidine/g of PHEMA. The maximum HIgG adsorption on the L-histidine immobilized PHEMA adsorbents was observed at pH 7.4. The non-specific HIaG adsorption onto the plain PHEMA adsorbents was very low- (about 0.167 mg/g). Higher adsorption values (up to 3.5 mg/g) were obtained when the L-histidine immobilized PHEMA adsorbents were used from aqueous solutions. Much higher amounts of HIgG were adsorbed from human plasma (up to 44.8 mg/g). Adsorption capacities of other blood proteins were obtained as 2.2 mg/g for fibrinogen and 2.8 mg/g for albumin. The total protein adsorption was determined as 52.1 mg/g. The affinity microbeads allowed the one-step separation of HIgG from human plasma. The HIgG molecules could be repeatedly adsorbed and desorbed with these L-histidine-immobilized PHEMA adsorbents without noticeable loss in their HIgG adsorption capacity.

Keywords: Hollow-Fiber Membranes, Protein-A, Peptide Libraries, Polyhydroxyethylmethacrylate Microbeads, Affinity-Chromatography, Kinetic Aspects, Purification, Adsorption, Removal, Ligands

Snukiškis, J. and Kaušpediene, D. (2002), Combined sorption of cobalt(II) and nonionic surfactant by polyacrylic acid-functionalized cation exchanger. *Separation Science and Technology*, **37** (4), 921-936.

Full Text: [S\Sep Sci Tec37, 921.pdf](S/Sep%20Sci%20Tec37,%20921.pdf)

Abstract: The kinetics of combined sorption of cobalt(II) and nonionic surfactant ALM-10 by hydrogen form of Purolite C 106 polyacrylic acid-functionalized cation exchanger were investigated: kinetic curves were obtained determining the concentration of nonionic surfactant spectrophotometrically, and that of cobalt(II) complexometrically. Reducing the initial solution acidity from pH 5 to 8, the coefficients of intraparticle diffusion (D) for cobalt(II) increase, although they decrease as the cation exchanger saturation increases. The sorption of the surfactant proceeds slower than that of cobalt(II).

Regeneration of the cation exchanger was performed using 0.7 M HCl for the removal of cobalt(II), 0.5 M NaOH for the removal of the surfactant, and 0.7 M HCl for the conversion to hydrogen form. Hydrogen form of Purolite C 106 can be applicable for the simultaneous removal of nonionic surfactant and cobalt(II) from plating rinse sewage to recover water for recycling.

Keywords: Heavy Metal, Nonionic Surfactant, Sorption, Cation Exchanger, Ion-Exchange, Metal-Ions, Equilibrium, Adsorption, Nickel, Resins

Park, S.W., Kim, S.S. and Sohn, I.J. (2002), Chemical equilibrium of trioctylmethylammonium chloride with aqueous solution of Cr(VI). *Separation Science and Technology*, **37** (4), 957-971.

Full Text: [S\Sep Sci Tec37, 957.pdf](S/Sep%20Sci%20Tec37,%20957.pdf)

Abstract: The distribution and dissociation equilibria of phase-transfer catalyst, trioctylmethyl-ammonium chloride (Q(+)Cl(-)), for the system of QCI-toluene-aqueous HCrO4- solutions were measured at 298K for the systems of toluene-water or -aqueous electrolyte solutions.

The evaluated distribution coefficients of trioctylmethylammonium chloride and the complex formed between trioctylmethylammonium cation and HCrO4- were correlated as a function of the ionic strength in the aqueous solutions. The dissociation constants, K1 and K2, were independent of ionic strength.

Keywords: Distribution Coefficient, Dissociation Constant, Trioctylmethylammonium Chloride, Ionic Strength, Salting-Out Parameter, Emulsion Liquid Membranes, Chromium(VI), Aliquat-336, Separation, Extraction, Recovery, Kinetics

? Pickett, J.L., Naderi, M., Chinn, M.J. and Brown, D.R. (2002), The adsorption and decomposition of cyanogen chloride by modified inorganic molecular sieves. *Separation Science and Technology*, **37** (5), 1079-1093.

Full Text: [2002\Sep Sci Tec37, 1079.pdf](2002/Sep%20Sci%20Tec37,%201079.pdf)

Abstract: Aluminosilicate and silicate porous solids have been evaluated as supports for triethylenediamine (TEDA) for the adsorption and decomposition of cyanogen chloride. A series of silica-gel supports has been used to study the effect of varying pore size. A series of faujasitic zeolites has been used to examine the effect of the cation exchange capacity of the support and the type of exchangeable cation. Results show that the activity of adsorbed TEDA towards cyanogen chloride appears to increase with increasing support pore diameter, and TEDA seems to be activated by basic adsorption sites on the support. Cesium-exchanged zeolite supports are particularly active. In general, zeolite supports appear to confer significantly higher activity to TEDA than traditional activated carbon supports. A series of mesoporous MCM-41 and AlMCM-41 supports has also been studied, but the activities of adsorbed TEDA are lower than expected. Significantly, the specific surface area of the inorganic supports does not seem to be a primary factor in controlling adsorbed TEDA activity.

Keywords: Acid Sites, Activated Carbon, Activity, Adsorbents, Adsorption, Capacity, Carbon, Catalysis, Cation Exchange Capacity, Chloride, Cyanogen Chloride, Decomposition, Ethanol, Exchangeable Cation, Inorganic, Ion, MCM-41, Modified, Pore Size, Porous, Separation, Silica, Silica Gel, Silicate, Sites, Specific Surface Area, Supports, Surface, Surface Area, Triethylenediamine, Zeolite, Zeolite-Y

Raichur, A.M. and Panvekar, V. (2002), Removal of As(V) by adsorption onto mixed rare earth oxides. *Separation Science and Technology*, **37** (5), 1095-1108.

Full Text: [S\Sep Sci Tec37, 1095.pdf](S/Sep%20Sci%20Tec37,%201095.pdf)

Abstract: Arsenic pollution of water is a major problem faced worldwide. Arsenic is a suspected carcinogen in human beings and is harmful to other living beings. In the present study, a novel adsorbent was used to remove arsenate [As(V)] from synthetic solutions. The adsorbent, which is a mixture of rare earth oxides, was found to adsorb As(V) rapidly and effectively. The effect of various parameters such as contact time, initial concentration, pH, and adsorbent dose on adsorption efficiency was investigated. More than 90% of the adsorption occurred within the first 10 min and the kinetic rate constant was found to be about 3.5 mg min−1. Adsorption efficiency was found to be dependent on the initial As(V) concentration, and the adsorption behavior followed the Langmuir adsorption model. The optimum pH was found to be 6.5. The presence of other ions such as nitrate, phosphate, sulphate, and silicate decreased the adsorption of As(V) by about 20–30%. The adsorbed As(V) could be desorbed easily by washing the adsorbent with pH 12 solution. This study demonstrates the applicability of naturally occurring rare earth oxides as selective adsorbents for As(V) from solutions.

Keywords: Arsenic, Adsorption, Rare Earth Oxide, Anion, Desorption

Ramesh, A., Mohan, K.R., Seshaiah, K. and Choudary, N.V. (2002), Removal of beryllium from aqueous solutions by zeolite 4A and bentonite. *Separation Science and Technology*, **37** (5), 1123-1134.

Full Text: [S\Sep Sci Tec37, 1123.pdf](S/Sep%20Sci%20Tec37,%201123.pdf)

Abstract: The adsorption and desorption of beryllium on zeolite 4A and bentonite has been studied using batch sorption studies. Parameters such as time of equilibrium, effect of pH, and effect of adsorbent dose on adsorption were studied. The adsorbents exhibited good sorption potentials for beryllium with a peak value at pH 5.0. The adsorption followed the Freundlich and Langmuir adsorption models. About 75% and more removal occurred within 20 min, and an equilibrium was attained at around 90 min for both adsorbents. Beryllium adsorption by zeolite 4A is higher than zeolite 13X and bentonite. The desorption studies were carried out using sodium chloride solution, and the effect of NaCl concentration on desorption was studied. Maximum desorption of 87% occurred with 10% NaCl.

Keywords: Beryllium, Zeolite 4A, Zeolite 13X, Bentonite, Removal, Aqueous Solutions

Venkatesan, K.A., Srinivasan, T.G. and Rao, P.R.V. (2002), Removal of complexed mercury from aqueous solutions using dithiocarbamate grafted on silica gel. *Separation Science and Technology*, **37** (6), 1417-1429.

Full Text: [S\Sep Sci Tec37, 1417.pdf](S/Sep%20Sci%20Tec37,%201417.pdf)

Abstract: Sorption of mercury from aqueous solution by dithiocarbamate grafted on silica gel was investigated. The influence of pH, Hg2+ concentration, time, temperature, and presence of various anions and complexing agents on the sorption of mercury was studied. The sorption data obtained as a function of mercury concentration was fitted into a Langmuir adsorption model, which showed a sorption capacity of similar to 61 mg/g. Kinetic data indicated a very rapid sorption in the early stages of equilibration. The endothermic enthalpy change accompanied by the sorption of mercury from 0.1 M HCl media was found to decrease from 44.7 to 24.4 kJ/mol when the initial concentration of mercury was increased from 7.5×10-4 to 1.5×10-3 M.

Keywords: Separation, Monolayers, Surface

Milich, P., Möller, F., Píriz, J., Vivó, G. and Tancredi, N. (2002), The influence of preparation methods and surface properties of activated carbons on Cr(III) adsorption from aqueous solutions. *Separation Science and Technology*, **37** (6), 1453-1467.

Full Text: [S\Sep Sci Tec37, 1453.pdf](S/Sep%20Sci%20Tec37,%201453.pdf)

Abstract: Activated carbons were prepared from eucalyptus wood, by using three different ‘physical’ activating methods: air and CO2 partial, gasification of wood char (2 hr, 400degreesC and 800degreesC, respectively), and direct CO2 partial gasification of wood sawdust. The three activated carbons were then oxidized with HNO3 for increasing the surface concentration of oxygenated functions, and Cr(III) aqueous solution adsorption isotherms were determined for each oxidized carbon. Characterization of the carbons were done through elemental analysis, N2 adsorption, and Fourier transform infrared spectroscopy spectra. Results show that oxidized activated carbons prepared from air gasification have the higher Cr(III) adsorption capacity. Conclusions about chemical functions formed onto the carbon surface and the relationship with Cr(III) adsorption are exposed

Keywords: Acid, Activated Carbon, Activated Carbons, Adsorption, Adsorption Isotherms, Chromium, Chromium(III), Eucalyptus Wood, Isotherms, Liquid Phase Adsorption, Nitric Acid Oxidation, Porous Structure, Preparation, Sawdust, Temperature, Wood

Lenz, K., Beste, Y.A. and Arlt, W. (2002), Comparison of static and dynamic measurements of adsorption isotherms. *Separation Science and Technology*, **37** (7), 1611-1629.

Full Text: [S\Sep Sci Tec37, 1611.pdf](S/Sep%20Sci%20Tec37,%201611.pdf)

Abstract: Adsorption isotherms can be determined experimentally by using either static or dynamic measuring methods. The adsorption behavior of the system dichloromethane-n-hexane on two normal-phase silica-gels was measured both statically by using the circulation method and dynamically by using the frontal analysis and the perturbation method. As a matter of conformity, adsorption excess isotherms, which are the results of static methods, should have to be converted into loading isotherms.

Analytical and different numerical conversion methods using different assumptions are presented and compared to each other. A conformity between the results of the analytical conversion method and the dynamically measured adsorption isotherms can be established if the decrease of the porosity with increasing loading is also taken into consideration.

Keywords: Liquid

Ohto, K., Inoue, S., Eguichi, N., Shinohara, T. and Inoue, K. (2002), Adsorption behavior of lead ion on calix[4]arene tetracarboxylic acid impregnated resin. *Separation Science and Technology*, **37** (8), 1943-1958.

Full Text: [S\Sep Sci Tec37, 1943.pdf](S/Sep%20Sci%20Tec37,%201943.pdf)

Abstract: The resins impregnating calix[4]arene tetracarboxylic acid into XAD-7 has been prepared to investigate adsorption behavior of lead ion. The leakage of the impregnated reagent to an aqueous solution is found to be negligible. The sequence in the adsorptive selectivity series for divalent metal ions on the present resin is as follows: Pb much greater than Cu > Zn > Ni approximate to Co. This sequence is also the same with that of the extractive selectivity series of p-t-octylcalix[4]arene as an extractant. The other adsorption properties of the resin for metal ions are similar to the extractive properties of the corresponding calix[4]arene tetracarboxylic acid. Maximum adsorption capacity of lead ion on the resin is found to be 0.33 mol kg-1. For endurance test, even in eight times repetitive experiment of adsorption followed by elution of lead, the resin is devitalized and available for repeatability. Column chromatographic separation of lead and zinc ions as an industrial application is also carried out. Selective adsorption of trace amounts of lead ion over excess amount of zinc ion is achieved.

Keywords: Calix[4]Arene Carboxylic Acid, Impregnated Resin, Adsorptive Separation, Lead Ion, Column Chromatography, Repetition Test, Calixarene Carboxylate Derivatives, Solid-Phase Extraction, Metal-Ions, Solvent-Extraction, Separation, Silver(I), Binding

Senel, S., Denizli, F., Yavuz, H. and Denizli, A. (2002), Bilirubin removal from human plasma by dye affinity microporous hollow fibers. *Separation Science and Technology*, **37** (8), 1989-2006.

Full Text: [S\Sep Sci Tec37, 1989.pdf](S/Sep%20Sci%20Tec37,%201989.pdf)

Abstract: Bioaffinity adsorption has a unique and powerful role as a support tool in the removal of toxic substances from human plasma. Synthetic hollow-fiber membranes have advantages as support matrices in comparison to conventional hemoperfusion columns because they are not compressible and they eliminate internal diffusion limitations. In this study, Cibacron Blue F3GA was covalently attached onto commercially available microporous polyamide hollow-fiber membranes for bilirubin removal from hyperbilirubinemic human plasma. Different amounts of Cibacron Blue F3GA were attached on the polyamide hollow-fibers by changing the dye-attachment conditions, i.e., initial dye concentration, addition of sodium carbonate, and sodium chloride. The maximum amount of Cibacron Blue F3GA attachment was obtained at 42.5 mumol g-1 when the hollow fibers were treated with 3 M HCl for 30 min before performing the dye attachment. The nonspecific bilirubin adsorption on the unmodified polyamide hollow-fiber membranes was 0.65 mg g-1 from human plasma. Higher bilirubin adsorption capacities, of up to 39.7 mg g-1, were obtained with the Cibacron Blue F3GA-attached polyamide hollow-fiber membranes. Further increase in bilirubin adsorption was obtained as 48.9 mg g-1. Bilirubin molecules interacted with these adsorbents directly. Contribution of albumin adsorption on the bilirubin adsorption was much pronounced. Bilirubin adsorption increased with increasing temperature and maximum adsorption was observed at 37degreesC.

Keywords: Hyperbilirubinemia, Bilirubin Removal, Cibacron Blue F3GA-Attached Polyamide Hollow Fibers, Packed-Bed Column, Albumin Adsorption, Poly(Egdma-Hema) Microbeads, Polymer Resins, Amino-Acid, Chromatography, Membranes, Pendants, Sorption, Beads

Ruiz, M., Sastre, A. and Guibal, E. (2002), Pd and Pt recovery using chitosan gel beads. I. Influence of the drying process on diffusion properties. *Separation Science and Technology*, **37** (9), 2143-2166.

Full Text: [S\Sep Sci Tec37, 2143.pdf](S/Sep%20Sci%20Tec37,%202143.pdf)

Abstract: Chitosan is very efficient at removing metal ions, especially precious metals. Sorption kinetics can be improved by the preparation of chitosan gel beads, using a coagulation procedure. However, this process leads to the formation of beads containing very high water yields, which prevent chitosan from being an economically competitive sorbent for large-scale industrial applications, for reasons linked to transport costs and handling. The air-drying of chitosan gel beads resulted in a decrease in the sorption rate, while the sorption performance at equilibrium was not influenced by the drying step. The influence of re-hydration was examined. The drying of beads saturated with saccharose was considered a simple alternative treatment, to prevent the restriction of the polymer network and improve sorption rate. The influence of these different treatments on both sorption kinetics and sorption isotherms was studied for the recovery of platinum and palladium from dilute solutions.

Keywords: Platinum, Palladium, Chitosan, Glutaraldehyde Cross-Linking, Sorption Isotherms, Sorption Kinetics, Drying Process

Bohrer, D., do Nascimento, P.C., Seibert, E. and de Carvalho, L.M. (2002), Polyethylene powder as an adsorbent for complexing dyes: Influence of dye structure, solvent, pH, and ionic strength. *Separation Science and Technology*, **37** (9), 2183-2199.

Full Text: [S\Sep Sci Tec37, 2183.pdf](S/Sep%20Sci%20Tec37,%202183.pdf)

Abstract: The application of polyethylene (PE) powder to the adsorption of complexing dyes has been studied. Rhodamine B, aluminon, *o*-phenanthroline and dithizone were used as model substances of cationic, anionic, slightly polar, and apolar species, respectively. The influence of PE type, solvent, pH, and ionic strength on the adsorption was investigated. The results showed that high-density PE adsorbs polar dyes, preferentially cationic dyes, from aqueous solutions, whereas low-density PE adsorbs apolar dyes from an apolar milieu. The adsorption of polar species occurs probably at negatively charged sites on the PE surface, whereas the apolar ones occurs at the apolar parts of the surface. Presence of salts and pH influence the adsorption, mainly of anionic dyes, for these, the lower the pH the higher the adsorption, showing that the undissociated anionic dye is adsorbed. The adsorption in ethanolic solutions was very weak, probably because ethanol, differently from water, wets PE and therefore competes with the dyes for the active sites on the PE surface. Complexes formed by metallic ions and dyes are also adsorbed on PE showing that, for analytical purposes, metallic cations can be separated from their matrix solutions using adequate PE and conditions for the separation.

Keywords: Adsorption, Dyes, Polyethylene Powder

Namasivayam, C., Yamuna, R.T. and Arasi, D.J.S.E. (2002), Removal of procion orange from wastewater by adsorption on waste red mud. *Separation Science and Technology*, **37** (10), 2421-2431.

Full Text: [S\Sep Sci Tec37, 2421.pdf](S/Sep%20Sci%20Tec37,%202421.pdf)

Abstract: The ability of waste red mud, an industrial by-product produced during the processing of bauxite ore, to remove procion orange was investigated at different initial dye concentrations, agitation time, adsorbent dosage, and pH. Adsorption followed the Freundlich isotherm model. A maximum removal of 82% of the dye was observed at pH 2.0. Desorption studies showed that maximum desorption occurred at a pH of 11.

Keywords: Aqueous-Solutions, Dye Adsorption, Reactive Dyes, Basic-Dyes, Equilibrium, Degradation, Adsorbents, Silica, Nickel, Color

Ruiz, M., Sastre, A. and Guibal, E. (2002), Pd and Pt recovery using chitosan gel beads. II. Influence of chemical modifications on sorption properties. *Separation Science and Technology*, **37** (10), 2385-2403.

Full Text: [S\Sep Sci Tec37, 2385.pdf](S/Sep%20Sci%20Tec37,%202385.pdf)

Abstract: Chitosan is very efficient at removing precious metals from dilute acid solutions. Its sorption properties can be improved by the chemical modification of the polymer. Several methods have been tested for chitosan modification including poly(ethylene imine) (PEI)-grafting, hydrogenation of imine function on glutaraldehyde-cross-linked chitosan, and thiourea- grafting. Depending on the modification technique, the improvement in sorption performance may consist, in an increase in sorption capacity (PEI-grafted chitosan), a change in the stability of the sorbent (hydrogenation of imine linkage) or an increase in the selectivity of sorption in the presence of co- ions (thiourea derivatives of chitosan). Chitosan gel beads were chosen rather than the flaked material, since the gel beads have enhanced diffusion properties. The influence of drying and re-hydration of the beads are studied for some of these chitosan derivatives with regard to their diffusion properties.

Keywords: Beads, Brines, Capacity, Chemical, Chemical Modification, Chitosan, Cross-Linking, Diffusion, Diffusion Properties, Drying, Equilibrium, Gel, Glutaraldehyde Cross-Linking, Hydrogenation, Ion Adsorption Capacity, Mercury(II), Metal-Ions, Metals, Modification, Molybdate Sorption, N-Carboxymethyl Chitosan, Palladium, Performance, Platinum, Poly(Ethyleneimine)-Grafting, Polymer, Properties, Recovery, Removal, Resins, Selectivity, Sodium Borohydride Reduction, Sorption, Sorption Capacity, Sorption Isotherms, Sorption Kinetics, Sorption Properties, Stability, Thiourea-Grafting

Sağ, Y. and Aktay, Y. (2002), A comparative study for the sorption of Cu(II) ions by chitin and chitosan: Application of equilibrium and mass transfer models. *Separation Science and Technology*, **37** (12), 2801-2822.

Full Text: [S\Sep Sci Tec37, 2801.pdf](S/Sep%20Sci%20Tec37,%202801.pdf)

Abstract: The sorption of Cu(II) by chitin, a naturally occurring material, and chitosan, prepared from chitin, was investigated and compared. The effect of pH, initial metal ion concentration, particle size, sorbent concentration, and stirring rate on sorption capacity was characterized by measuring the sorption isotherms. Sorption data of chitin and chitosan were best modeled by the Langmuir and Redlich-Peterson isotherms, although they can be modeled by the Freundlich and BET sorption models. Next, batch studies were carried out to identify the rate-controlling steps for Cu(II) sorption. Single resistance models were used in the determination of the external film mass transfer step and the intraparticle diffusion step.

Keywords: Waste-Water Treatment, Cu(II) Ions, Sorption, Chitin, Chitosan, Equilibrium Sorption Models, Mass Transfer Models, Binary Metal Mixtures, *Rhizopus-Arrhizus*, Activated Carbon, *R-arrhizus*, Biosorption, Adsorption, Copper, Chromium(VI), Derivatives, Acid

Peleanu, I., Maria Zaharescu, M., Rau, I., Crisan, M., Jitianu, A. and Meghea, A. (2002), Nanocomposite materials for As(V) removal by magnetically intensified adsorption. *Separation Science and Technology*, **37** (16), 3693-3701.

Full Text: [S\Sep Sci Tec37, 3693.pdf](S/Sep%20Sci%20Tec37,%203693.pdf)

Abstract: New nanocomposite adsorbent based on silica and iron(III) oxide, thermally treated at 200°C has been used for the arsenic(V) removal. Adsorbents were prepared by sol-gel method, the iron oxides being generated in situ during the sol-gel process. Nanocomposite materials thus obtained have a convenient porosity and nanosized iron oxide content. The sorption experiments have been carried out in a batch mode by using aqueous solutions containing 1000 ppm As. The influence of different experimental parameters on the adsorption capacity was investigated. The effect of magnetic field on the enhancement of adsorption process was also revealed.

Mathialagan, T. and Viraraghavan, T. (2003), Adsorption of cadmium from aqueous solutions by vermiculite. *Separation Science and Technology*, **38** (1), 57-76.

Full Text: [S\Sep Sci Tec38, 57.pdf](S/Sep%20Sci%20Tec38,%2057.pdf)

Abstract: The present study involves an investigation of a low-cost adsorbent, vermiculite for the removal of cadmium from aqueous solutions. The effects of pH and contact time on the adsorption process were examined. The optimum pH for adsorption was found to be 6. Residual cadmium concentration reached equilibrium in four hours and the rate of cadmium adsorption by Vermiculite was rapid in the first hour of the reaction time. Ho’s pseudo second order model best described the reaction rate. Batch adsorption experiments conducted at room temperature (22±1°C) showed that the adsorption pattern followed the Freundlich isotherm model. The maximum removal of cadmium obtained from batch studies was 96%. Thomas model was used to describe the adsorption data from column studies. Overall, the results showed that vermiculite could be considered as a potential adsorbent for cadmium removal from aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Process, Aqueous Solutions, Batch, Batch Adsorption, Batch Studies, Cadmium, Cadmium Adsorption, Cd(II), Column, Column Studies, Concentration, Contact, Data, Effects, Equilibrium, Experiments, First, Fly-Ash, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Investigation, Isotherm, Isotherm Model, Isotherms, Kinetics, Kinetics, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Model, Pattern, Peat, pH, Potential, Process, Pseudo, Pseudo Second Order, Pseudo-Second-Order, Removal, Room Temperature, Second Order, Second-Order, Solutions, Temperature, Thomas Model, Vermiculite, Water

? Díaz-Nava, C., Solache-Ríos, M. and Olguín, M.T. (2003), Sorption of fluoride ions from aqueous solutions and well drinking water by thermally treated hydrotalcite. *Separation Science and Technology*, **38** (1), 131-147.

Full Text: [2003\Sep Sci Tec38, 131.pdf](2003/Sep%20Sci%20Tec38,%20131.pdf)

Abstract: Fluoride is a naturally occurring element in many water supplies, and it may cause fluorosis. The hydrotalcite was synthesized and characterized before and after the retention of fluoride ions by x-ray diffraction, electron microscopy, and IR. The thermally treated hydrotalcite was evaluated for the sorption of fluoride ions from aqueous solutions at pH 5, 7, and 9 and well water. It was found that the retention of fluoride ions by the material was 80% or higher. The Kd values show that the best conditions for the sorption of F- ions from the solutions is at pH 5, and they show as well that the physicochemical properties affect the uptake process.

Keywords: Adsorption, Drinking Water, Exchange, Fluoride, pH, Sorption

? Kubota, N., Goto, I., Nakashima, Y. and Eguchi, Y. (2003), Adsorption and desorption of serum proteins using cellulosic affinity membrane modified with N-acetyl-L-phenylalanine. *Separation Science and Technology*, **38** (2), 323-336.

Full Text: [2003\Sep Sci Tec38, 323.pdf](2003/Sep%20Sci%20Tec38,%20323.pdf)

Abstract: A cellulosic affinity membrane modified with N-acetyl-L-phenylalanine (N-Ac-L-Phe) was prepared intending to separate and purify the serum proteins. A porous cellulose membrane was first reacted with acrylonitrile to afford a cyanoethyl cellulose membrane (CEC membrane). After reduction of the cyano groups of the CEC membrane to obtain aminopropyl cellulose membrane (APC membrane), N-Ac-L-Phe was bound to the APC membrane through amide linkage (APC-Phe membrane). The pH dependence of the adsorption of serum proteins on the APC-Phe membrane was investigated in a dead-end flow mode, using bovine serum albumin (BSA) and gamma-globulin (BgammaG) as model proteins. The adsorption behavior of BSA and BgammaG on the APC-Phe membrane was rather independent of pH, and the amount of BSA adsorbed on the membrane was greater than that of BgammaG. The BSA adsorbed on the APC-Phe membrane was recovered with hydroxycarboxylic acid solutions, whereas, it was not effectively eluted with NaCl solution.

Keywords: Acrylonitrile, Adsorption, Affinity Membrane, Albumin, Behavior, Bovine, Bovine Serum Albumin, Bsa, Cellulose, Chromatography, Dependence, Desorption, Elution, Flow, Fractionation, Gamma-Globulin, Globulin, Ligands, Membrane, Model, Modified, pH, pH Dependence, Phenylalanine, Porous, Porous Cellulose Membrane, Proteins, Purification, Recovery, Reduction, Serum, Tannic-Acid

Jain, A.K., Gupta, V.K., Bhatnagar, A. and Suhas (2003), A comparative study of adsorbents prepared from industrial wastes for removal of dyes. *Separation Science and Technology*, **38** (2), 463-481.

Full Text: [S\Sep Sci Tec38, 463.pdf](S/Sep%20Sci%20Tec38,%20463.pdf)

Abstract: Waste materials such as blast furnace dust, sludge and slag from steel plants and carbon slurry from fertilizer plants were treated and activated to prepare low-cost adsorbents. The adsorbents were chemically characterized and the surface area determined. The carbonaceous adsorbent prepared from carbon slurry had appreciable surface area (380 m2/g), whereas, the other three adsorbents had poor surface area (428 m2/g). The adsorption of three basic dyes, that is, chrysoidine G, crystal violet, and meldola blue was studied on all the adsorbents and the results indicated that only carbonaceous adsorbent removed the dyes from solution to an appreciable extent compared to the others. The carbanaceous adsorbent can, therefore, be a useful material for dye removal. All further studies were, therefore, done on the carbonaceous adsorbent. The adsorption isotherms of the dyes were found to conform to the Langmuir equation. The thermodynamic parameters calculated indicated that the dye adsorption was exothermic and physical in nature. The kinetic studies of the adsorption process showed it to be first order and pore diffusion controlled. The adsorption with the carbonaceous adsorbent is about 70-80% of the amount taken up by standard activated charcoal. Thus, the prepared carbonaceous adsorbent is efficient and can be used for the removal of dyes from solution.

Keywords: Low Cost Adsorbents, Adsorption, Basic Dyes, Carbonaceous Adsorbent, Low-Cost Adsorbent, Acid Dye, Natural Adsorbents, Aqueous-Solutions, Reactive Dyes, Adsorption, Effluent, Water, Peat, Equilibrium

Abu Al-Rub, F.A., Kandah, M. and Al-Dabaybeh, N. (2003), Competitive adsorption of nickel and cadmium on sheep manure wastes: Experimental and prediction studies. *Separation Science and Technology*, **38** (2), 483-497.

Full Text: [S\Sep Sci Tec38, 483.pdf](S/Sep%20Sci%20Tec38,%20483.pdf)

Abstract: Sheep manure wastes (SMW) previously have been shown to be very efficient in removing nickel and cadmium from single-component, dilute aqueous solutions. Simultaneous removal of nickel and cadmium ions from aqueous solutions using SMW has been investigated in this study. The experimental results showed that the SMW has a relatively higher affinity for cadmium binding than that for nickel. Different multicomponent-isotherm models, extended Langmuir, modified Langmuir, extended Redlich-Peterson, and extended Sips isotherm models, were used to predict the removal of either ions using single metal isotherm data.

Keywords: Adsorption, Nickel, Cadmium, Heavy Metals, Manure, Isotherm, Activated Carbon, Removal, Biosorption, Copper, Sorbents, Water, Zinc, Ions

Kim, H.T., Lee, C.H., Shul, Y.G., Mon, J.K. and Lee, E.H. (2003), Evaluation of PAN-TiO2 composite adsorbent for removal of Pb(II) ion in aqueous solution. *Separation Science and Technology*, **38** (3), 695-713.

Full Text: [S\Sep Sci Tec38, 695.pdf](S/Sep%20Sci%20Tec38,%20695.pdf)

Abstract: A polyacrylonitrile-TiO2 composite adsorbent bead was prepared to remove Pb2+ ion in aqueous solution. The dual nozzle technique was applied to prepare a spherical bead. The prepared composite adsorbent was found to be highly porous and stable against strong acids. Adsorption tests showed that Pb2+ ion adsorption increased in proportion to pH and Pb2+ ion was completely removed at pH 5.60. The equilibrium and kinetic parameters such as equilibrium constant, adsorption capacity, film mass-transfer coefficient, and effective diffusivity were also evaluated by modeling the experimental data.

Keywords: Mass-Transfer, Waste-Water, Lead, TiO2, Polyacrylonitrile, Exchangers, Adsorption, Extraction, Sorption, Cadmium

Ottosen, L.M., Kristensen, I.V., Pedersen, A.J., Hansen, H.K., Villumsem, A. and Ribeiro, A.B. (2003), Electrodialytic removal of heavy metals from different solid waste products. *Separation Science and Technology*, **38** (6), 1269-1289.

Full Text: [S\Sep Sci Tec38, 1269.pdf](S/Sep%20Sci%20Tec38,%201269.pdf)

Abstract: A variety of heavy metal polluted waste,products must be handled today. Electrochemical methods have been developed for remediation of polluted soil. One of the methods is the electrodialytic remediation method that is based on electromigration of heavy metal ions and ionic species within the soil matrix, land a separation of the soil and the process solutions, where the heavy metals are concentrated, with ion exchange membranes. For remediation of some soils, such as calcareous soils, it is necessary to add an enhancement solution. It was shown in a laboratory experiment that ammonium citrate could be used when removing Cu and Cr from a soil with 25% carbonates. The final concentrations of the elements were below the target values after the remediation. A question of whether the electrodialytic remediation method can be used for other waste products arose. Preliminary experiments showed that the method could be used for removal of different heavy metals from impregnated wood waste, fly ash from straw combustion, and fly ash from municipal solid waste incineration. The best result was obtained with the wood waste where more than 80% of each of the polluting elements Cu, Cr and As was removed in a 7-day experiment in which oxalic acid was used as enhancement solution. From the straw ash, 66% of the Cd was removed, but 64% of the fly ash dry mass dissolved during the treatment. In this actual experiment, no enhancement solution was used but that will be necessary to avoid dissolution of the ash to such a high extent. For the fly ash from waste incineration, ammonium citrate was tested as enhancement solution and in 14 days 62% Cd, 53% Cu, 6% Pb, and 31% Zn were removed. The preliminary results were thus promising for developing the electrodialytic method to other products than soil, although more research is needed especially in finding the best enhancement solutions for each product.

Keywords: Ash, Cd, Copper, Electrodialysis, Electrodialytic Remediation, Electrokinetic Remediation, Enhancement Solution, Fly Ash, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metal, Ion Exchange, Metal Ions, Metals, Oxalic Acid, Remediation, Soil, Solid Waste, Speciation, Waste, Wood

Zhang, A.Y., Uchiyama, G. and Asakura, T. (2003), The adsorption properties and kinetics of uranium(VI) with a novel fibrous and polymeric adsorbent containing amidoxime chelating functional group from seawater. *Separation Science and Technology*, **38** (8), 1829-1849.

Full Text: [S\Sep Sci Tec38, 1829.pdf](S/Sep%20Sci%20Tec38,%201829.pdf)

Abstract: The adsorption properties of U(VI) with a new type of fibrous and polymeric adsorbent containing amidoxime chelating functional group (FPAO) from seawater was studied by the method of the static state adsorption at 25degreesC. The optimum conditions of the adsorption were determined by investigating the influence of the concentrations of FPAO, U(VI), feed acidity, temperature, and the shape and size of FPAO on the adsorption equilibrium. The maximum adsorption capacity of U(VI) in theory was deduced to be 384.6 mg/g dry FPAO by Langmuir isothermic adsorption equation. Freundlich isothermic adsorption equation, expressed as Q=4.116 [U(VI)](0.4293), shows that this process can taken place easily because the adsorption factor 1/n equals to 0.4293, which is in the region of 0.1-0.5. Meanwhile, the adsorption kinetics of U(VI) with FPAO was also studied. The rate equation of the adsorption reaction was determined as -d[U(VI)]/dt=k[U(V)IFPAO](1.70)/[H+] and the rate constant of the adsorption reaction k was calculated to be 0.5912 min-1 for pH 6.0 and ionic strength 0.1 mol/l. The activation energy of the adsorption reaction was calculated to be 28.54 kJ/mol. On the basis of the kinetics results, the adsorption mechanism of FPAO on U(VI) was discussed. The diffusion of uranium ion in internal of the adsorbent was thought to be the rate-controlling step.

Keywords: Fibrous Adsorbent, Adsorption Properties and Kinetics, Amidoxime, Uranium, Seawater, Sea-Water, Recovery, UO22+

? Denizli, A., Yavuz, H., Arpa, C., Bektas, S. and Genc, O. (2003), Cysteinylhexapeptide attached poly(2-hydroxyethyl methacrylate) beads for Cd(II) removal from human plasma in a packed-bed column. *Separation Science and Technology*, **38** (8), 1869-1881.

Full Text: [2003\Sep Sci Tec38, 1869.pdf](2003/Sep%20Sci%20Tec38,%201869.pdf)

Abstract: Poly(hydroxyethyl methacrylate) (PHEMA) beads (in the size range of 150-200 μm) with good mechanical properties were prepared and crosslinked with ethylene glycol dimethacrylate (EGDMA) to increase their chemical stability. Because of their hydroxyl groups, they can serve as affinity adsorbent and can be employed for medical applications. Cibacron Blue F3GA was succesfully immobilized onto the beads. The maximum dye attachment was 16.5 μmol/g. Then, metallopeptide-ligand cysteinylhexapeptide (CysHP) was incorporated onto these beads and they were used for removal of cadmium ions [Cd(II)] from human plasma in a packed-bed column. The maximum amount of CysHP attached was 3.2 mg/g. Non specific Cd(II) adsorption from human plasma on the PHEMA beads was 0.32 mg/g. The adsorption capacity of the beads decreased from 11.8 to 3.7 mg/g with the raise of the flow-rate from 1.0 to 5.0 ml/min. It has been found that the CysHP loading has a great effect on the capacity of beads for adsorbing Cd(II) ions from human plasma. This suggests that these modified beads could be used for removal of Cd(II) ions from human plasma.

Keywords: Adsorbent, Adsorption, Affinity, Affinity Beads, Cd(II) Removal, Chromatography, Cibacron Blue F3GA, Dye, Flow Rate, Ions, Metal Detoxification, Microspheres, Packed-Bed, Poly(2-Hydroxyethyl Methacrylate), Proteins, Purification, Removal

? Jia, Q., Wang, Z.H., Li, D.Q. and Niu, C.J. (2003), Adsorption studies of divalent metal ions with extraction resin containing 1-hexyl-4-ethyloctyl isopropylphosphonic acid. *Separation Science and Technology*, **38** (9), 2025-2037.

Full Text: [2003\Sep Sci Tec38, 2025.pdf](2003/Sep%20Sci%20Tec38,%202025.pdf)

Abstract: Equilibrium distributions of cobalt(II), nickel(II), zinc(II), cadmium(II), and copper(II) have been studied in the adsorption with extraction resin containing 1-hexyl-4-ethyloctyl isopropylphosphonic acid (HEOPPA) as an extractant from chloride medium. The distribution coefficients are determined as a function of pH. The data are analyzed both graphically and numerically. The extraction of the metal ions can be explained assuming the formation of metal complexes in the resin phase with a general composition ML2(HL)(q). The adsorbed species of the metal ions are proposed to be ML2 and the equilibrium constants are calculated. The efficiency of the resin in the separation of the metal ions is provided according to the separation factors values. The separation of Zn from Ni, Cd, Cu, Co, and Co from Ni, Cd, Cu with the resin is determined to be available. Furthermore, Freundlich’s isothermal adsorption equations and thermodynamic quantities, i.e., ΔG, ΔH, and ΔS are determined.

Keywords: 1-Hexyl4-Ethyloctyl Isopropylphosphonic Acid, Adsorption, Aqueous-Solutions, Cadmium(II), Cd, Chloride, Co, Cobalt(II), Composition, Copper(II), Cu, Cyanex-272, Data, Distribution, Divalent Metal Ions, Efficiency, Equilibrium, Extraction, Extraction Resin, Function, General, Impregnated Resins, Isothermal, Isothermal Adsorption, Levextrel Resin, Metal, Metal Complexes, Metal Ions, Nickel(II), Palladium(II), pH, Resin, Separation, Species, Thermodynamic, Zinc(II)

Say, R., Yilmaz, N. and Denizli, A. (2003), Biosorption of cadmium, lead, mercury, and arsenic ions by the fungus *Penicillium Purpurogenum*. *Separation Science and Technology*, **38** (9), 2039-2053.

Full Text: [S\Sep Sci Tec38, 2039.pdf](S/Sep%20Sci%20Tec38,%202039.pdf)

Abstract: The potential use of the fungus *Penicillium Purpurogenum* to remove cadmium, lead, mercury, and arsenic ions from aqueous solutions was evaluated. Biosorption of heavy metal ions reached equilibrium in 4 h. Heavy metal ions binding by *Penicillium Purpurogenum* was clearly pH dependent. Heavy metal loading capacity increased with increasing pH under acidic conditions, presumably as a function of heavy metal speciation and due to the H+ competition at the same binding sites. The adsorption of heavy metal ions reached a plateau value at around pH 5.0. The maximum adsorption capacities of heavy metal ions onto the fungal biomass under noncompetitive conditions were 35.6 mg/g for As(III), 70.4 mg/g for Hg(II), 110.4 mg/g for Cd(II) and 252.8 mg/g for Pb(II). Their adsorption behavior can be described at least approximately with the Langmuir equation. The competitive adsorption capacities of the heavy metal ions were 3.4 mg/g for As(III), 15.8 mg/g for Hg(II), 13.1 mg/g for Cd(II), and 41.8 mg/g for Pb(II) at 50 mmol/L initial concentration of metal ions. The same affinity order on a molar basis was observed under noncompetitive and competitive adsorption conditions, which was as follows: Pb(II)>Cd(II)>Hg(II)>As(III). The equilibrium loading capacity of Pb(II) was greater than that of other metal ions. This fungal biomass showed a preference for binding Pb(II) over Cd(II), Hg(II), and As(III). Elution of heavy metal ions was performed using 0.5 M HCl. The fungus *Penicillium Purpurogenum* could be used for ten cycles for biosorption.

Keywords: Admium(II), Lead(II), Mercury(II), Arsenic(III), Heavy Metals, Fungal Biomass, Biosorption, *Penicillium Purpurogenum*, *Phanerochaete-Chrysosporium*, Heavy-Metals, *Saccharomyces-cerevisiae*, *Aspergillus-niger*, *Rhizopus-arrhizus*, *Zoogloea-ramigera*, Aqueous-Solution, Removal, Accumulation, Adsorption

Lazaridis, N.K., Jekel, M. and Zouboulis, A.I. (2003), Removal of Cr(VI), Mo(VI), and V(V) ions from single metal aqueous solutions by sorption or nanofiltration. *Separation Science and Technology*, **38** (10), 2201-2219.

Full Text: [S\Sep Sci Tec38, 2201.pdf](S/Sep%20Sci%20Tec38,%202201.pdf)

Abstract: The removal of Cr(VI), Mo(VI), or V(V) anions from single metal aqueous solutions was studied. Two alternative treatment methods were applied: (1) sorption of these anions onto commercially available akaganeite (beta-FeOOH) or (2) nanofiltration, using a commercial spiral-wound pilot-scale unit. During sorption experiments, kinetics and equilibrium were mainly studied. A modified second-order kinetic model was found to better fit the kinetic results. Freundlich isotherms better described (slightly) chromium and molybdenum equilibrium sorption experiments, whereas Langmuir isotherm better described vanadium equilibrium. During nanofiltration experiments, the influence of pH and of initial anion concentration was mainly studied, using a fixed background electrolyte concentration.

Keywords: Akaganeite, Removal, Anions, Sorption, Nanofiltration, Chromium, Molybdenum, Vanadium, Hexavalent Chromium, Activated Carbon, Waste-Water, Adsorption, Extraction, Flotation, Chromate, Molybdenum(VI), Vanadium(IV), Groundwater

Machado, R.M., Correia, M.J.N. and Carvalho, J.M.R. (2003), Integrated process for biosorption of copper from liquid effluents using grape stalks. *Separation Science and Technology*, **38** (10), 2237-2254.

Full Text: [S\Sep Sci Tec38, 2237.pdf](S/Sep%20Sci%20Tec38,%202237.pdf)

Abstract: A multistage process was used for biosorption of heavy metals from liquid effluents using grape stalks as the biosorbent. The biosorption was carried out with a free biomass suspension in a two-stage, countercurrent, stirred batch system. The biomass was separated from the treated effluent using flocculation, sedimentation, and filtering. The filter cake was used, as a small packed column loaded with heavy metals where the elution was performed.

The efficiency of the overall system was studied using three synthetic effluents. The first two effluents labeled in this work as F1 and F2 had 10 and 50 ppm of copper, respectively. The third effluent had a complex metal mixture containing 10 ppm of copper, 50 ppm of zinc, 5 ppm of nickel, 100 ppm of calcium, and 100 ppm of sodium. The biosorption system was able to remove 99% of the copper from the F1 effluent (0.08 ppm of copper in the final effluent), using a biomass concentration of 2 g/L. For the F2 effluent, a biomass concentration of 4 g/L was required to obtain a final copper concentration 0.18 ppm. Copper was also removed from the F3 effluent with an efficiency of 98% (final metal concentration of 0.15 ppm). However, it required a biomass concentration of 6 g/L in the two biosorption stages and the other target metals under study, Zn and Ni, had modest removals of 46% and 35%, respectively.

The results from the elution experiments demonstrate that the key variables to obtain high metal concentration in the eluate are the metal concentration bounded to the biomass, the superficial velocity of the eluant, and the filter cake depth. Using the F2 effluent to load the biomass up to 12.5 mg/g of copper and performing the elution with a superficial velocity of 0.9 cm/min in a filter cake with depth of 10 cm, a copper concentration in the eluate of 1.8 g/L was achieved, which correspond to a concentration factor of 38-fold.

Keywords: Bisorption, Heavy Metals, Biomass, Grape Stalks, Recovery, Cadmium, Biomass, Zinc

Yeon, K.H. and Moon, S.H. (2003), A study on removal of cobalt from a primary coolant by continuous electrodeionization with various conducting spacers. *Separation Science and Technology*, **38** (10), 2347-2371.

Full Text: [S\Sep Sci Tec38, 2347.pdf](S/Sep%20Sci%20Tec38,%202347.pdf)

Abstract: The production of high purity water in the primary coolant of a nuclear power plant was investigated using a CEDI process with three ion-conducting spacers, i.e., ion-exchange resin (IX), an immobilized ion-exchange polyurethane resin (IEPU), and an ion-exchange textile (IET). The spacers were characterized by varying experimental conditions, e.g., dosage of adsorbent, pH of the solution, contact time, and the porous-plug model. The CEDI stack was assembled as a bed layered with the cation-exchange and anion-exchange materials. The stack configuration was designed to prevent a reaction between the metal ions and hydroxide ions. The performance of the CEDI operation with the layered bed showed more than 99% removal of the ions at a current efficiency ranged from 18 to 24%. In this study, the feasibility of using the CEDI in operations for the removal of heavy metals present at very low concentrations was successfully demonstrated.

Keywords: Ion-Conducting Spacer, Ion-Exchange Resin, Ion-Exchange Polyurethane, Ion-Exchange Textile, Continuous Electrodeionization, Waste-Water, Adsorption

Guibal, E., Guzman, J., Navarro, R. and Revilla, J. (2003), Vanadium extraction from fly ash - Preliminary study of leaching, solvent extraction, and sorption on chitosan. *Separation Science and Technology*, **38** (12-13), 2881-2899.

Full Text: [S\Sep Sci Tec38, 2881.pdf](S/Sep%20Sci%20Tec38,%202881.pdf)

Abstract: Fly ashes resulting from the combustion of fuel containing high concentrations of vanadium that can be slightly removed by water and more efficiently by alkaline or acid solutions. This uncontrolled release can contaminate water sources and requires appropriate storage of fly ashes. This study investigated the possibility of cleaning the ashes by leaching the material and recovering vanadium by solvent extraction (for metal concentration solutions higher than 200 mg V L-1) using several amine extractants (Primene JM-T, Amberlite LA-2, Alamine 336, and Alamine 304), a quaternary ammonium salt (Aliquat 336), and by a sorption process (for low-metal concentration solutions) using chitosan. Extraction and stripping were investigated with liquid extractants and showed that Aliquat 336 was the best of these extractants. However, since Aliquat 336 exhibits a greater difficulty at stripping, secondary or tertiary amine extractants appear more suited for the extraction process. Vanadium sorption occurs on chitosan through anion exchange with a maximum sorption capacity of 400 to 450 mg V g-1 at pH 3. The treatment of acid leachates with chitosan does not appear possible, since it requires a pH control to pH 3, which precipitates ferric ions and coprecipitates vanadium. Alternative routes could be the alkaline leaching of fly ashes and a further pH control.

Keywords: Amine Extractants, Beads, Chitosan, Chitosan Sorption, Coal, Combustion, Equilibrium, Fly Ash, Leaching, Oil, Peat, Solvent Extraction, Sorption, Vanadium, Wood

Guibal, E., McCarrick, P. and Tobin, J.M. (2003), Comparison of the sorption of anionic dyes on activated carbon and chitosan derivatives from dilute solutions. *Separation Science and Technology*, **38** (12-13), 3049-3073.

Full Text: [S\Sep Sci Tec38, 3049.pdf](S/Sep%20Sci%20Tec38,%203049.pdf)

Abstract: Activated carbon and chitosan were investigated for the sorption of several dyes. While the sorption on activated carbon was largely independent of the pH, the sorption of dyes on chitosan was controlled by the acidity of the solution. Anionic dye sorption onto chitosan occurred through electrostatic attraction on protonated amine groups. Sorption experiments were focused on dilute solutions and sorption capacities ranged between 200 and 2000 μmol g-1 for chitosan and between 50 and 900 μmol g-1 for activated carbon. Since, in most cases, equilibrium was reached within the first 12 hours of contact, sorption kinetics are relatively fast. However, both sorption capacities (sorption isotherms) and kinetics depended on the type of dyes. The attempt to correlate sorption performance to the structure of the dye failed. Sorption kinetics are strongly influenced not only by intraparticle diffusion resistance but also by the affinity of the dye for the sorbent.

Keywords: Chitosan, Activated Carbon, Anionic Dyes, Sorption, Isotherms, Kinetics, Intraparticle Diffusion-Processes, Aqueous-Solutions, Reactive Dyes, Waste-Water, Soluble Chitosans, Color Removal, Adsorption, Chitin, Equilibrium, Isotherms

Chu, K. and Hashim, M. (2003), Modeling batch equilibrium and kinetics of copper removal by crab shell. *Separation Science and Technology*, **38** (16), 3927-3950.

Full Text: [S\Sep Sci Tec38, 3927.pdf](S/Sep%20Sci%20Tec38,%203927.pdf)

Abstract: The adsorption characteristics of copper from aqueous solutions on crab shell were determined by batch tests. The uptake equilibrium and kinetics were affected by the pH of the sorption system. In the pH range of 3 to 6, the extent of copper removal was found to increase with increasing pH. A Langmuir-Freundlich model with pH-dependent parameters and an extended Langmuir-Freundlich model with pH-independent parameters were found to account very well for the measured constant pH equilibrium isotherms. Four existing rate models (second-order reversible reaction, second-order irreversible reaction, pseudo first-order, and Elovich) were evaluated in simulating transient sorption profiles measured over a pH range of 3 to 6. The rate coefficients of the four models exhibited a linear dependence on the pH of the sorption system. Given the mathematical simplicity of the four rate models and their apparent success in accounting for the experimental observations throughout the whole time course of sorption, any one of the models can be used as a means for predicting the transient behavior of the copper-crab shell sorption system with reasonable accuracy.

Keywords: Adsorption, Chitosan, Crab Shell, Equilibrium, Kinetics, Modeling, Polyaminated Chitosan Beads, Aqueous-Solutions, Activated Carbon, Bone Char, Sorption, Adsorption, Chitin, Thermodynamics, Desorption, Sorbents

Solisio, C., Lodi, A., Converti, A. and Del Borghi, M. (2003), Influence of temperature on cadmium removal by Sphaerotilus natans from acidic solutions. *Separation Science and Technology*, **38** (16), 3951-3966.

Full Text: [S\Sep Sci Tec38, 3951.pdf](S/Sep%20Sci%20Tec38,%203951.pdf)

Abstract: A culture of Sphaerotilus natans (NCIMB 11196) was used for cadmium removal from acidic solutions, simulating the composition of industrial wastewaters. Tests were carried out at temperatures increasing from 15 up to 40degreesC, to check the actual possibility of utilizing a biological system to remove this heavy metal from water as well as, to shed light on the phenomenon responsible for its uptake. The highest values of the specific growth rate of this microorganism (μmux = 0.11 to 0.13 h-1) and cadmium removal rate (kr = 0.15 h-1) were obtained within 25 to 30degreesC. Under these conditions, biomass was able to increase the pH of the medium from 4.0 up to 7.0 to 7.8. The data of μmux and kr collected at different temperatures were finally used. to estimate, according to Arrhenius, the thermodynamic parameters of cell growth and cadmium removal as well as of the related thermal inactivations. On the basis of these results, cadmium seemed to be removed by S. natans following a mechanism controlled by cell growth, implying the quick electrostatic attraction of ions to the negative charges present on the cell surface.

Keywords: Cadmium Biosorption, Sphaerotilus Natans, Acidic Solutions, Batch Tests, Temperature, Thermodynamics, Industrial Waste-Water, Ion-Exchange, Heavy-Metals, Fly-Ash, Biosorption, Biomass, Equilibrium, Adsorption, Recovery, Copper

Moreira, R.D.F.P.M., Madeira, V.S., José, H.J. and Humeres, E. (2004), Removal of iron from water using adsorbent carbon. *Separation Science and Technology*, **39** (2), 271-286.

Full Text: [S\Sep Sci Tec39, 271.pdf](S/Sep%20Sci%20Tec39,%20271.pdf)

Abstract: A novel adsorbent carbon to remove iron from water was evaluated. Bench scale and pilot scale tests were performed to characterize the mechanism of the iron removal. The adsorption equilibrium of iron removal can be described using the Langmuir isotherm, assuming a monolayer. In the absence of dissolved oxygen, Fe2+ is adsorbed on the solid surface as a monolayer of 62.7×10-3 mat-g·g-1, while the monolayer of oxidized iron coverage in the air-equilibrated system is 72.7×10-3mat-g·g-1. The iron removal results from the adsorption of oxygen followed by the oxidation of Fe2+ catalyzed by the adsorbent carbon surface. The Fe3+ precipitates on the solid, forming a hydrated iron oxide-coated carbon that is also able to adsorb iron. The kinetics of iron removal was modeled using the film and pore diffusion model. Pilot tests performed with and without pre-aeration showed results similar to those observed on the bench scale.

Keywords: Iron Removal, Water, Kinetics, Adsorbent Carbon

Özcan, A.S., Tetik, S. and Özcan, A. (2004), Adsorption of acid dyes from aqueous solutions onto sepiolite. *Separation Science and Technology*, **39** (2), 301-320.

Full Text: [S\Sep Sci Tec39, 301.pdf](S/Sep%20Sci%20Tec39,%20301.pdf)

Abstract: This research deals with an investigation of the adsorption of two acid dyes, namely Acid Red 57 (AR57) and Acid Blue 294 (AB294) onto sepiolite. Batch kinetics and isotherm studies were carried out. The results indicate that the adsorption of acid dyes obeys Freundlich isotherm and the second-order kinetics model. In addition, the effectiveness of sepiolite on adsorption of AR57 and AB294 from aqueous solution was studied as a function of time, pH, and temperature. Thermodynamic parameters for the adsorption of dyes were calculated and are discussed., The maximum removals of acid dyes was observed around 90% and 75% at pH = 2 for AR57 and AB294, respectively.

Keywords: Adsorption, Acid Dyes, Clays, Isotherm, Sepiolite, Kinetics, Natural Adsorbents, Textile Effluents, Activated Carbons, Methylene-Blue, Color Removal, Basic-Dyes, Fly-Ash, Sorption, Behavior, Clay

Dambies, L. (2004), Existing and prospective sorption technologies for the removal of arsenic in water. *Separation Science and Technology*, **39** (3), 603-627.

Full Text: [S\Sep Sci Tec39, 603.pdf](S/Sep%20Sci%20Tec39,%20603.pdf)

Abstract: The present article is devoted to a review of existing and emerging sorption technologies for the removal of arsenic in water. After presenting the traditional sorbents used in arsenic removal, experimental studies to characterize the adsorptive capacities of sorbents are detailed. In a second part, metal-loaded polymers, which are among the prospective technologies for arsenate and arsenite removal in drinking water, are introduced. Finally, the design of new metal-loaded polymers to treat arsenic in drinking water is discussed.

Keywords: Arsenic Removal, Arsenate, Arsenite, Adsorption, Ion Exchange, Metal-Loaded Polymers, Water Treatment, Ligand-Exchange Sorption, Hydrous Zirconium-Oxide, Ferric Ion Form, Chelating Resin, Adsorption Characteristics, Activated Carbon, Aqueous-Solution, Anions, Separation, Chitosan

Vaishya, R.C. and Gupta, S.K. (2004), Modeling arsenic(V) removal from water by sulfate modified iron-oxide coated sand (SMIOCS). *Separation Science and Technology*, **39** (3), 645-666.

Full Text: [S\Sep Sci Tec39, 645.pdf](S/Sep%20Sci%20Tec39,%20645.pdf)

Abstract: The batch kinetics of arsenic(V) on a novel media developed by coating BaSO4 and Fe on quartz sand, known as sulfate modified iron-oxide coated sand (SMIOCS), was investigated. Batch rate data were analyzed using active available site and chemical reaction rate models. The batch kinetic data were a better fit on an active, available site model as compared to a chemical reaction rate model. The media was characterized for certain chemical properties and surface area. The media showed alkali resistance with the presence of iron, barium, and sulfur on the surface. The Langmuir and Freundlich isotherm equations could be used to describe the partitioning behavior of system at different pH. The removal of As(V) on SMIOCS was pH dependent and maximum removal was observed in acidic pH range. The variation in ionic strength and chloride (Cl-) concentration in the solute do not play a significant role in As(V) removal efficiency but major anions showed some reduction in As(V) removal efficiency. A very small concentration of silica drastically reduced arsenic removal efficiency. However, the presence of Ca2+ and Mg2+ as cations improved arsenic(V) removal efficiency. The fixed bed studies indicated that the breakthrough time for arsenic(V) removal is dependent on the initial influent arsenic concentrations. These results suggest that arsenate adsorption on SMIOCS media may play an important role for arsenic immmobilization.

Keywords: Arsenic(V) Removal, Water, Sulfate Modified Iron-Oxide Coated Sand, Arsenate Adsorption, Surface-Chemistry, Natural Waters, Ferrihydrite, Goethite, Groundwater, Kinetics

? BišKup, B. and Subotić, B. (2004), Removal of heavy metal ions from solutions using zeolites. III. Influence of sodium ion concentration in the liquid phase on the kinetics of exchange processes between cadmium ions from solution and sodium ions from zeolite A. *Separation Science and Technology*, **39** (4), 925-940.

Full Text: [2004\Sep Sci Tec39, 925.pdf](2004/Sep%20Sci%20Tec39,%20925.pdf)

Abstract: Kinetics of exchange processes between the sodium ions from zeolite A and cadmium ions from solutions containing different contents of Na+ ions was determined by measuring changes in the concentrations of cadmium and sodium ions in both zeolite and the liquid phase during the exchange processes. The exchange kinetics were analyzed in accordance with the kinetic model derived on the basis of the second-order forward reaction between the cadmium ions from solution and the sodium ions from zeolite A and on the second-order backward reaction between sodium ions from solution and cadmium ions from zeolite A. The equilibrium cadmium uptake on zeolite A decreases with increasing concentration of sodium ions in the liquid phase. Agreement between the measured exchange kinetics and the exchange kinetics calculated by numerical solutions of the model equations shows that the exchange process takes place in accordance with the proposed model.

Keywords: Zeolite A, Ion Exchange, Sodium Ions, Cadmium Ions, Exchange Kinetics, Available Synthetic Zeolites, Natural Zeolites, Waste-Water, Cation-Exchange, Self-Diffusion, Lead Removal, Thin-Layers, Na+ Ions, Clinoptilolite, Cesium

? Aoyama, M., Kishino, M. and Jo, T.S. (2004), Biosorption of Cr(VI) on Japanese cedar bark. *Separation Science and Technology*, **39** (5), 1149-1162.

Full Text: [2004\Sep Sci Tec39, 1149.pdf](2004/Sep%20Sci%20Tec39,%201149.pdf)

Abstract: The ability of Japanese cedar (Cryptomeria japonica) bark to remove Cr(VI) from aqueous solutions was investigated. The research parameters included the solution pH, temperature, and initial concentration of Cr(VI) in solution. The removal of Cr(VI) was highly solution pH dependent and adsorbate concentration dependent, and mainly governed by physicochemical adsorption under the weak acidic conditions studied (initial solution pHgreater than or equal to 3). However, the reduction of Cr(VI) to Cr(III) occurred extensively at low solution pH (initial solution pHless than or equal to 2). The equilibrium data at different temperatures fit well in the Langmuir isotherm model. The endothermic nature of the adsorption was confirmed by the positive value of enthalpy change (18.9 kJ mol-1). The positive value of entropy change (65.2 J mol-1 K-1) suggested the increased randomness at the solid-solution interface during the adsorption. The studies showed that Japanese cedar bark can be used as a cost-effective adsorbent for the removal of Cr(VI) from wastewater.

Keywords: Removal of Cr(VI), Cryptomeria Japonica Bark, Adsorption, Langmuir Isotherm, Adsorption Thermodynamics, Wastewater Treatment, Aqueous-Solution, Hexavalent Chromium, Coniferous Leaves, Waste-Water, Removal, Adsorption, Carbon, Ions, Adsorbent, Trivalent

? Basso, M.C., Cerrella, E.G. and Cukierman, A.L. (2004), Cadmium uptake by lignocellulosic materials: Effect of lignin content. *Separation Science and Technology*, **39** (5), 1163-1175.

Full Text: [2004\Sep Sci Tec39, 1163.pdf](2004/Sep%20Sci%20Tec39,%201163.pdf)

Abstract: Two lignocellulosic materials with different lignin contents (18 and 42%wt) and pure lignin (PL) were evaluated for their effectiveness in binding cadmium from dilute solutions in various concentrations. Maximum sorption capacities (Xm), determined from equilibrium isotherms by applying the Langmuir model, indicated that PL (Xm = 48.3 mg/g) and the sample with the larger lignin content (Xm = 22.2 mg/g) showed a reasonable ability to uptake cadmium. An increasing relationship between X-m and the sample’s lignin content was found, considering the tested materials together with others evaluated earlier under identical conditions. Pure lignin attained the highest value. Accordingly, the lignin content of lignocellulosic materials appears as an indicator of their ability to uptake cadmium. It could facilitate their screening for potential use as alternative cadmium sorbents from dilute wastewater. The effects of the sample’s dose and the solution pH on cadmium uptake also were investigated.

Keywords: Alternative Sorbents, Lignocellulosic Wastes, Heavy Metals Removal, Wastewater Treatment, Aqueous-Solutions, Toxic Metals, Waste-Water, Removal, Carbons, Biosorption, Thermodynamics, Biosorbents, Adsorption, Recovery

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Full Text: [2004\Sep Sci Tec39, 1407.pdf](2004/Sep%20Sci%20Tec39,%201407.pdf)

Abstract: Coconut coir pith, a solid waste generated in coir fibre industries, was carbonized and used as adsorbent for the removal of 2,4-dichlorophenol (2,4-dCP) from water. Varying parameters such as agitation time, 2,4-dCP concentration, adsorbent dose, pH, and temperature were investigated. Adsorption equilibrium reached at 60, 80, 100, and 120 min for 2,4-dCP concentrations of 10, 20, 30, and 40 mg L-1, respectively. Adsorption followed pseudo-second order kinetics. The adsorption equilibrium data moderately obeyed Langmuir and Freundlich isotherms. The adsorption capacity was found to be 19 mg g-1 of carbon. Increase of temperature increased adsorption. Acidic pH was favorable for the adsorption of 2,4-dCP. Studies on pH effect and desorption show that both physisorption and chemisorption were involved in the adsorption process.

Keywords: 2,4-Dichlorophenol, Adsorbent, Adsorption, Chlorophenols, Coir Pith Carbon, Desorption Studies, Equilibrium, Isotherms, Kinetics, pH Effect, Phenolic-Compounds, Pseudo-Second-Order, Sorption, Water

? Liao, M.H., Wu, K.Y. and Chen, D.H. (2004), Fast adsorption of crystal violet on polyacrylic acid-bound magnetic nanoparticles. *Separation Science and Technology*, **39** (7), 1563-1575.

Full Text: [2004\Sep Sci Tec39, 1563.pdf](2004/Sep%20Sci%20Tec39,%201563.pdf)

Abstract: The adsorption of crystal violet from an aqueous solution by polyacrylic acid-bound magnetic nanoparticles was studied. It was shown that the magnetic nano-adsorbent was quite efficient or the adsorption/desorption of crystal violet. In the aqueous solution of crystal violet at 25degreesC, the adsorption behavior followed the Langmuir adsorption isotherm with a maximum adsorption amount of 116 mg g-1 and a Langmuir adsorption equilibrium constant of 0.005 L mg-1. In the methanol solution of acetic acid (1.0-8.0%), desorption of crystal violet increased up to 100% with increasing the acetic acid concentration. The reusability of magnetic nano-adsorbent and the effects of temperature, pH, and phosphate on the adsorption of crystal violet were also investigated. Additionally, it was very noteworthy that the adsorption/desorption rate of crystal violet was quite fast (required time < 1 min) clue to the absence of pore-diffusion resistance. The developed magnetic nano-adsorbent will be useful in the removal of cationic dyes from wastewater.

Keywords: Adsorption, Polyacrylic Acid, Crystal Violet, Magnetic Nanoparticles, Nano, Malachite Green, Dye, Adsorbent, Removal, Powder, Water

? Martin-Dupont, F., Gloaguen, V., Granet, R., Guilloton, M. and Krausz, P. (2004), Chemical modifications of Douglas fir bark, a lignocellulosic by-product: Enhancement of their lead(II) binding capacities. *Separation Science and Technology*, **39** (7), 1595-1610.

Full Text: [2004\Sep Sci Tec39, 1595.pdf](2004/Sep%20Sci%20Tec39,%201595.pdf)

Abstract: Chemical modification of Douglas fir bark and its subsequent utilization in adsorption of Ph2+ from aqueous solutions was investigated. We developed a new solvent-free approach to enhance the natural properties of bark by utilizing polyfunctional groups covalently attached at their surface. The hydroxyl groups of their polysaccharide moiety were functionalized by periodate oxidation and derivatized via reductive amination in presence of aspartic acid or 4,4’-diamino-2,2’-stilbene disulfonic acid. The degree of substitution of derivatized bark was estimated by the means of pH titration. Adsorption isotherms of Ph2+ on derivatized barks were determined and compared with the performances of crude bark. Adsorption was characterized using the noncompetitive Langmuir adsorption model in terms of affinity (b) and maximum binding capacities (q(max)). Derivatization resulted in enhancements of both q(max) (x 4 - 7) and b (x 1.5 - 10). These experimental data are discussed in the context of the Hard and Soft Acid and Base theory.

Keywords: Adsorption, Adsorption Isotherms, Biosorption, Cellulose, Chemical Modifications, Coniferous Barks, Decontamination, Douglas Fir Bark, Heavy-Metal Ions, Langmuir, Lead, Lignocellulosic, Mechanisms, Recovery, Removal, Sorption, Synthetic Solutions

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Full Text: [2004\Sep Sci Tec39, 1733.pdf](2004/Sep%20Sci%20Tec39,%201733.pdf)

Abstract: Activated clay, montmorillonite, and activated carbon were used for the removal of two basic dyes, Basic Green 5 (BG5) and Basic Violet 10 (BV10). Both dynamic and equilibrium data were obtained by the batch technique. The dynamic data indicate that the activated carbon was suitable for FIGS but not for BV10 primarily due to the molecular structure, whereas the montmorillonite was not good for either basic dye due to its low surface area for adsorption. The adsorption process was analyzed in terms of two pseudosteady-state equations and the intraparticle diffusion model. The adsorption isotherms of Langmuir and Freundlich as well as Langmuir-Freundlich types were employed to examine the equilibrium adsorption data. Results show that all the adsorption systems could be adequately fitted by the Langmuir-Freundlich equation. Thermodynamic parameters were also obtained.

Keywords: Activated Carbon, Activated Clay, Montmorillonite, Adsorption, Basic Dyes, Activated Carbon, Pore Diffusion, Mass-Transfer, Fly-Ash, Color Removal, Bagasse Pith, Dyestuffs, Sorption, Kinetics, Model

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Full Text: [2004\Sep Sci Tec39, 1751.pdf](2004/Sep%20Sci%20Tec39,%201751.pdf)

Abstract: In this study, the recovery of copper from synthetic wastewaters prepared from CUSO4 was studied using a fluidized bed containing hydrogen-based solid Amberlite. The effects of operating parameters including liquid flow rate, initial copper ions concentration, pH of the influent solution, and Amberlite weight on the breakthrough curves were investigated. It was found that the copper uptake increased with the increase in Amberlite weight, the decrease in initial copper concentration, and decrease in liquid flow rate, but there was no affect with solution influent pH. The recovery of cadmium and lead ions prepared from CdSO4 and Pb(NO3)2, respectively, was also investigated. Comparison between the adsorption of Cu2+, Cd2+ and Pb2+ showed that the adsorption capacity followed the following order: Pb2+ > Cd2+ > Cu2+. It was found that the order of adsorption was independent of the flow rate or the initial feed concentration.

Keywords: Adsorption, Fluidization Waste Water, Industrial Waste, Heavy Metals, Zinc, Exchange, Streams

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Full Text: [2004\Sep Sci Tec39, 2041.pdf](2004/Sep%20Sci%20Tec39,%202041.pdf)

Abstract: Adsorption equilibrium, kinetics, and column dynamics of chlorophenols [2-chlorophenol (2-CP) and 2,4-dichlorophenol (2,4-DCP)] dissolved in water were studied using a hydrophobic resin, XAD-1600, without ion-exchange functional groups. In addition, a hydrophilic nonionic polymer resin, XAD-7, and an activated carbon, F400, were chosen for comparative analysis. Adsorption equilibrium data were correlated with the well-known Langmuir, Freundlich, and Sips isotherms. The adsorption amount was in the order of F400 > XAD-1600 > XAD-7. Desorption from polymeric resins adsorbed with chlorophenols was conducted by using two organic solvents [methanol and isopropyl alcohol (IPA)] as desorbates. The intraparticle diffusion mechanism was assumed to be the surface diffusion or pore diffusion. It was found that the diffusivity in desorption step was considerably slower than the diffusivity in adsorption step within polymeric resins. To confirm the possibility of the resin as a sorbent for the removal of chlorophenols, adsorption breakthrough curves were measured under key operating conditions, such as concentration, flow rate, and column length. A simple dynamic model was also formulated to describe both the adsorption and desorption breakthrough curves of chlorophenols.

Keywords: Adsorption, Desorption, Kinetics, Dynamics, Polymeric Sorbent

? Watanabe, Y., Yamada, H., Tanaka, J., Komatsu, Y. and Moriyoshi, Y. (2004), Ammonium ion exchange of synthetic zeolites: The effect of their open-window sizes, pore structures, and cation exchange capacities. *Separation Science and Technology*, **39** (9), 2091-2104.

Full Text: [2004\Sep Sci Tec39, 2091.pdf](2004/Sep%20Sci%20Tec39,%202091.pdf)

Abstract: Ammonium ion exchange behavior of synthetic zeolites, i.e., sodalite (SOD), rho zeolite (RHO), Linde type A zeolite (LTA), and faujasite zeolite (FAU), was investigated by changing the initial concentration of ammonium ions and reaction time. Ammonium ion exchange behavior was dependent on the open-window sizes, the pore structures, and the cation exchange capacities of these zeolites. Regarding sodalite with Nat ions (Na-SOD), ammonium ion exchange did not completely occur at the equilibrium state because the open-window size is smaller than the diameter of ammonium ions. Regarding RHO with Nat and Cst ions (NaCs-RHO), the larger cations, Cst ion, in the cages obstructed the ion exchange at the initial stage. However, the amount of exchanged ammonium ions gradually increased with increasing reaction time, finally achieving equilibrium. Regarding LTA with Nat ions (Na-LTA), the amount of exchanged ammonium ions decreased with increasing reaction time, and then reached plateau. It indicated that both the ion exchange on the a-cages and physical adsorption on the b-cages occurred at the initial stage, which was followed by the equilibrium state of ion exchange on the a-cages. Regarding FAU with Nat ions (Na-FAU), no dependence on reaction time was observed, because the size of the open-windows is large enough for ion exchange of ammonium ions. The Na-FAU, which has the biggest open-windows among these zeolites, showed the highest exchange capacity for ammonium ions, 3.20 mmol/g.

Keywords: Ammonium, Ion Exchange, Open-Window Size, Pore Structure, Synthetic Zeolite

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Full Text: [2004\Sep Sci Tec39, 2419.pdf](2004/Sep%20Sci%20Tec39,%202419.pdf)

Abstract: Experimental investigations were carried out to adsorb red colored chrysoidine dye from an aqueous medium by using activated charcoal (AC) as an adsorbent. The effects of adsorbent dose, initial dye concentration, contact time, pH, and temperature were studied for the adsorption of chrysoidine under stirred conditions and batch wise. Standard adsorption isotherms were considered to fit the experimental equilibrium data. It was found that the adsorption of chrysoidine on AC follows the Freundlich adsorption isotherm. The rate of adsorption was described by both first- and pseudosecond-order kinetic models. Experimental investigations also were carried out for the regeneration of spent carbon by applying surfactant enhanced carbon regeneration (SECR) technique by using both cationic and anionic surfactant. An empirical kinetic model for regeneration of adsorbent was presented.

Keywords: Chrysoidine, Activated Charcoal, Adsorption Isotherm, Carbon Regeneration, Cationic Surfactant, Anionic Surfactant, Containing Effluents, Waste-Water, Different Bentonites, Color Removal, Azo Dyes, Fly-Ash, Decolorization, Ozonation

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Full Text: [2004\Sep Sci Tec39, 2695.pdf](2004/Sep%20Sci%20Tec39,%202695.pdf)

Abstract: This paper presents a study about the sorption of the cadmium-diethyldithiocarbamate [Cd(II)-DDTC] complex onto polyurethane foam (PUF). It was observed that the maximum sorption of Cd(H) (80 or 150 mug L-1) was verified at pH 6.8 in the presence of 4.5×10-5 mol L-1 DDTC. The shaking time needed to achieve the equilibrium was 40 min. From these data, a kinetic characterization was performed by applying three models, which revealed that a film-diffusion process was a rate-determining mechanism. Results also indicated that an ether-like solvent extraction was the sorption mechanism. The investigation of many metallic ions as concomitants showed that the sorption by foam is relatively selective and it can be enhanced by using a suitable masking agent or incrementing the foam mass.

Keywords: Solid-Phase Extraction, Polyurethane Foam, Diethyldithiocarbamate, Cadmium, Trace-Element Preconcentration, Universal Matrix, Organic Reagents, Metal-Ions, Sorption, Separation, Silver, Cobalt, Collection, Adsorption

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Full Text: [2004\Sep Sci Tec39, 2711.pdf](2004/Sep%20Sci%20Tec39,%202711.pdf)

Abstract: The present study involves an investigation on the comparison of a Mexican clinoptilolite-heulandite zeolitic mineral and the modified zeolitic material with the surfactant hexadecyltrimethylammonium bromide (HDTMA) for the removal of cadmium from aqueous solutions. The effects of pH and contact time on the adsorption process were examined. The optimum pH for adsorption was found to be 7. Cadmium retention reached equilibrium in 32 h and the rate of cadmium adsorption by the zeolites was rapid in the first 10 h. Elovich’s model best described the reaction rate. Batch adsorption experiments conducted at room temperature showed that the adsorption pattern followed the Langmuir-Freundlich isotherm model. The cadmium retention capacity decreased very slightly when the zeolite surface was modified with the surfactant HDTMA, and this material has advantages for its use in the removal of some other contaminants, such as anions and nonpolar organic compounds, like phenols. The results showed that natural zeolite and the surfactant modified zeolite could be considered as potential adsorbents for cadmium removal from aqueous solutions.

Keywords: Clinoptilolite, Ion Exchange, Cadmium, Adsorption, HDTMA, Ion-Exchange, Sorption, Kinetics, Clinoptilolite, Effluents, Chromate, Metals, Peat

? Santhy, K. and Selvapathy, P. (2004), Removal of heavy metals from wastewater by adsorption on coir pith activated carbon. *Separation Science and Technology*, **39** (14), 3331-3351.

Full Text: [2004\Sep Sci Tec39, 3331.pdf](2004/Sep%20Sci%20Tec39,%203331.pdf)

Abstract: The activated carbon prepared from coconut coir pith by potassium hydroxide activation was found to exhibit remarkable adsorption capacity for cadmium, copper, and zinc. Batch equilibrium tests showed that the extent of metal removal was found to be dependent on initial concentration, contact time, pH, and carbon dose. It was found that at pH values below 3, the adsorption of metal ions was very less and was effective above pH 6. The metal ion sorption was found to follow the Freundlich model. The kinetics of adsorption of metal ions followed 1st order. The agglomerated coir pith carbon was evaluated for the effect of flow rate and bed depth in column experiments. Linear relationships between bed depth and service time were obtained for all the metal ions by performing bed-depth service time (BDST) analysis. The adsorbed metal ions could be quantitatively recovered by using 1.0 M HCl, and the capacity of carbon remained unaffected when put to repeated use for the removal of metal ions from aqueous solutions. The efficiency of carbon when applied to industrial effluents was found to be superior in removal of metal ions compared with the commercial ones.

Keywords: Coir Pith, Activated Carbon, Heavy Metals, Adsorption, Batch Studies, Freundlich Isotherm, Kinetics, Column Studies, BDST, Effluent Treatment, Equilibrium, Cadmium

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Full Text: [2004\Sep Sci Tec39, 3509.pdf](2004/Sep%20Sci%20Tec39,%203509.pdf)

Abstract: Sorption of silver ions onto coconut (Cocos nucifera) husk has been studied in detail using radiotracer technique. Maximum sorption (98%) of Ag ions (8.23×10-4 M) onto sorbent surface is achieved from 4.5 mL of 0.1 M HNO3 solution within 20 min using 200 mg of coconut husk. The sorption data follow the Freundlich and Dubinin-Radushkevich (D-R) isotherms. The values of Freundlich characteristic constants 1/n = 0.98 ± 0.09 and of A(m) 0.35 ± 0.05 m mole g-1 and D-R constants beta = -0.006207 ± 0.000439 kJ2 mole-2, Xm = 0.57 ± 0.08 m mole g-1, and E = 9.0±0.3 kJ mole-1 have been computed. The variation of sorption with temperature yields thermodynamic parameters eters DeltaH = 61.3±5.4 k J mole-1, DeltaS = 241.9±18.7 J mol-1 K-1, and DeltaG = -10.6 ± 0.09 k J mole-1 at 298 K. The positive enthalpy and negative value of free energy reflect the endothermic and spontaneous nature of sorption respectively. Sulphate, Al(III), Ni(II), and Ba(II) enhance the sorption significantly whereas Ce(III) and citrate cause its suppression appreciably. To check the selectivity of the coconut husk, the sorption of a number of metal ions on the sorbent surface has been measured under optimized conditions. The results indicate that coconut husk can be used to separate Ag ions from Cs(I), Zn(II), Cr(III), Co(II), and Se(IV).

Keywords: Ag(I) Ions, Sorption, Radiotracer Technique, Thermodynamics, Sorption Isotherms, Coconut Husk, Hg(II) Ions, Sorption, Radiotracer, Bark, Adsorption, Behavior, Binding

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Full Text: [2004\Sep Sci Tec39, 3739.pdf](2004/Sep%20Sci%20Tec39,%203739.pdf)

Abstract: Korean natural zeolite in which clinoptilolite and mordenite coexisted with feldspar and illite as impurities, was treated with 1.0, 3.0, and 5.0 M NaOH solutions at 100, 150, and 200degreesC under autogeneous pressure for 17 hours either with or without an air classification as pretreatment. Phillipsite, analcime, and hydroxycancrinite were identified as reaction products depending on the reaction temperature and NaOH concentration. The air classification of the starting material prior to alkali-hydrothermal treatment effectively reduced the amount of feldspar, which hardly reacted to zeolite in the hydrothermal reaction. The ammonium adsorption behavior of the treated and untreated samples were investigated in solutions of between 10-3 M and 10-2 M NH4Cl. The amount of adsorbed ammonium ions in alkalihydrothermally treated product from air-classified material was higher by about two times than was that of corresponding untreated zeolites. The air-classified zeolite treated in 3 M NaOH solution at 100degreesC showed the highest adsorption of ammonium ion among samples. It was explained by both the phase change of clinoptilolite and mordenite to phillipsite with higher cation exchange capacity and the reduction in the amount of feldspar that was less reactive under hydrothermal conditions for the formation of phillipsite. The results indicated that the combination of the air classification and alkali-hydrothermal treatment effectively improved the adsorption behavior for ammonium ions on natural zeolites with impurities.

Keywords: Adsorption, Air, Air Classification, Alkali-Hydrothermal Treatment, Ammonium, Australian Zeolite, Behavior, Capacity, Cation Exchange Capacity, Classification, Clinoptilolite, Concentration, Ion, Korean Natural Zeolite, Modification, Mordenite, Natural, Pressure, Products, Reaction, Reduction, Removal, Temperature, Treatment, Zeolite

? Coutinho, M.R., Quadri, M.B., Moreira, R.F.P.M. and Quadri, M.G.N. (2004), Partial purification of anthocyanins from Brassica oleracea (red cabbage). *Separation Science and Technology*, **39** (16), 3769-3782.

Full Text: [2004\Sep Sci Tec39, 3769.pdf](2004/Sep%20Sci%20Tec39,%203769.pdf)

Abstract: Red cabbage has a high content of anthocyanin and it may become an important source of this pigment. Common extraction methods are not selective, and a great quantity of sugar is co-extracted with the dye. This work used adsorption-desorption process on Amberlite XAD7 and Sephadex LH20 resins to partially purify anthocyanins present in the whole juice of red cabbage. Both resins succeeded to purify anthocyanins, producing solutions with up to 0.5 g L-1 of sugars from an initial concentration of more than 25 g L-1. Using Amberlite XAD7 it was possible to recover 24 to 95% of the dye initially found in the whole juice while 11 to 56% was recovered using Sephadex LH20. The kinetics of adsorption of the dye on Amberlite XAD7 was described according to a pseudo-second-order model, and the sorption equilibrium was well described by the Freundlich isotherm. The adsorption enthalpy was -17.13 kcal mol-1, indicating a possible chemical adsorption.

Keywords: Anthocyanin, Purification, Sorption, Red Cabbage, Kinetics, Stability, Sorption, Potato, Peat

? Kasaini, H., Everson, R.C. and Bruinsma, O.S.L. (2005), Selective adsorption of platinum from mixed solutions containing base metals using chemically modified activated carbons. *Separation Science and Technology*, **40** (1-3), 507-523.

Full Text: [2005\Sep Sci Tec40, 507.pdf](2005/Sep%20Sci%20Tec40,%20507.pdf)

Abstract: Bituminous coal was activated by using steam at 750degreesC in a furnace. The activated carbon (AC) particles were chemically treated with thiophosphoric and amine type extractants, then characterized and tested for precious metal selectivity in chloride media. The adsorption of anions [PtCl43-, PdCl42-] or cations [PtCl+, PdCl(H2O)3+, Ni(H2O)+, Cu2+]on the carbon surface was elucidated by means of complexation and physical adsorption models. Owing to electrostatic repulsion in acidic media (>1 M HCl), the thio- and amine-treated bituminous ACs did not react with copper and nickel cations. The adsorption rate constant for platinum showed a dependence on solution pH and extractant dosage on the surface of the carbon and was of the order 10-2 min-1. A three-parameter Toth isotherm best described the adsorption data for single component solutions. Furthermore, platinum adsorption was described by pseudo first order kinetics neglecting the intraparticle diffusivity.

Keywords: Activated Carbon, Adsorption, Adsorption Rate, Amine, Carbon, Chloride, Coal, Complexation, Copper, Dependence, Didodecylmonothiophosphoric Acid, Dosage, HCl, Isotherm, Kinetics, Metals, Model, Models, Modified, Nickel, Palladium, Particles, Pd(II), Pellets, pH, Physical Adsorption, Platinum, Rate Constant, Rh(III), Selectivity, Separation, Solvent-Extraction, Surface

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Full Text: [2005\Sep Sci Tec40, 1293.pdf](2005/Sep%20Sci%20Tec40,%201293.pdf)

Abstract: Biosorption of cadmium from aqueous solutions on Aeromonas caviae particles was investigated in a well-stirred batch reactor. Equilibrium and kinetic experiments were performed at various initial bulk concentrations, biomass loads, temperatures, and ionic background. Equilibrium data were well described by typical Langmuir and Freundlich adsorption isotherms. Furthermore, a detailed analysis was conducted to test several chemical reaction kinetic models in order to identify a suitable kinetic equation, assuming that biosorption is chemical sorption controlled. Predictions based on the so-called pseudo second order rate expression were found in satisfactory accordance with experimental data.

Keywords: Biosorption, Cadmium(II), Equilibrium Study, Kinetic Study, Metals, Heavy-Metals, Aqueous-Solutions, Biomass, Equilibrium, Removal, Ions, Biosorbents, Effluents, Recovery, Bacteria

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Full Text: [2005\Sep Sci Tec40, 1781.pdf](2005/Sep%20Sci%20Tec40,%201781.pdf)

Abstract: The inorganic phase, Na0.2Mo0.03W0.97O3 - ZH(2)O (MoHTB), which has been previously shown to be selective for Cs+ and Sr2+ from acidic radwaste simulants (0.075 mmol - L-1, 1.0 M HNO3) has been granulated with polyacrylonitrile (PAN) to afford a composite adsorbent suitable for deployment in small scale, fixed-bed columns. The uptake of Cs+ and Sr2+ by the MoHTB-PAN composites from such an acidic radwaste simulant is optimal for granular material of mesh size < 0.3 mm but satisfactory uptake rates are also observed with material of mesh size 0.3-0.63 turn. The fixed-bed column adsorption of Cs+ and Sr2+ from acidic radwaste simulant affords breakthrough curves which are of a typical ‘S’ shape profile but desorption of adsorbed Sr2+ by Cs+ in the radwaste simulant occurs after the composite column achieves equilibrium with respect to Sr2+. A simplified model of the adsorption of Cs+ and Sr2+ by the MoHTBPAN composite fixed-bed column has been applied to these initial results and has been shown to have utility in describing the performance of the fixed-bed column setup at the equimolar concentrations of Cs+ and Sr2+ employed.

Keywords: Ion-Exchange, Radwaste, Cesium, Strontium, Composite Adsorbent, Fixed-Bed Adsorption, Ion-Exchange Properties, Titanosilicate, Tungstates

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Full Text: [2005\Sep Sci Tec40, 1797.pdf](2005/Sep%20Sci%20Tec40,%201797.pdf)

Abstract: Batch adsorption experiments were conducted in the laboratory, aiming to the removal of aluminum from aqueous solutions onto powdered marble wastes (PMW) as an effective inorganic sorbent, which is inexpensive, widespread, and may represent an environmental problem. The main parameters (i.e., initial solution pH, sorbent and Al3+ ions concentrations, stirring times and temperature) influencing the sorption process in addition to the effect of some foreign ions was examined. The results obtained revealed that the sorption of Al3+ ions onto PMW is endothermic in nature and followed first-order kinetics. The adsorption data were well described by the Langmuir, Freundlich and Dubinin-Radushkevich (D-R) adsorption models over the concentration range studied. Under the optimum experimental conditions employed, the removal of ca. 100% of Al3+ ions was attained. The procedure was successfully applied to the removal of aluminum from aqueous and different natural water samples with an RSD (%), does not exceed 2.12%. Moreover, the adsorption mechanism is suggested.

Keywords: Aluminum, Sorption, Powdered Marble Wastes, Natural Waters, Aqueous-Solutions, Hexavalent Chromium, Activated Carbon, Drinking-Water, Oleic-Acid, Fly-Ash, Ions, Copper(II), Flotation, Sorption

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Full Text: [2005\Sep Sci Tec40, 3149.pdf](2005/Sep%20Sci%20Tec40,%203149.pdf)

Abstract: Biosorption of nickel(II) and copper(II) ions from aqueous solution by dead sphaeroplea algae in natural and acid treated forms were studied as a function of concentration, pH, and adsorbent dose. The optimum pH for nickel(II) and copper(II) biosorption was found to be 6.0 and 4.0 respectively. The metal ion uptake increased with initial metal ion concentration studied up to 500 mg/L. Both the Freundlich and Langmuir adsorption models could fit the equilibrium data. The adsorption reasonably fitted the Lagergren kinetic model. Further the biomass was characterized by FTIR spectra. Surface area values are measured to be 0.9 and 2.1 m2/g for natural and acid treated forms respectively. The maximum adsorption capacity was found to be 3.40, 4.15 mmol/g for nickel(II) and 2.21, 3.41 mmol/g for copper(II) in natural and acid treated forms respectively.

Keywords: Green Algae, Biosorption, Nickel, Copper, FTIR, Waste Water, Metal-Ions, Adsorption, Biomass, Lead, Equilibrium, Removal, Cadmium, Cu(II), Zinc

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Full Text: [2006\Sep Sci Tec41, 43.pdf](2006/Sep%20Sci%20Tec41,%2043.pdf)

Abstract: The concept of higher order frequency response functions, used for investigation of weekly nonlinear systems by frequency response techniques, is applied to investigation of membrane systems. Isothermal permeation of single gases through non-porous and porous membranes is analysed for three transport mechanisms: solution-diffusion, pore-surface diffusion, and viscous-flow. In the course of definition of the transmembrane transport in dynamic conditions, a new concept of generalized membrane permeability, defined as an indefinite sequence of the permeabilities of the first, second, third,...order, dependent on the equilibrium and transport parameters of the membrane in steady-state, is introduced. A simple two-reservoir system, with variation of the volume of one reservoir, is defined and its first and second order frequency response functions are derived. It is shown that these functions can be used for identification of the transport mechanism, i.e., of the corresponding model and for estimation of the model parameters: permeabilities of different orders, as well as the separate values of the relevant equilibrium and transport parameters.

Keywords: Membrane Transport, Nonlinear Frequency Response, Higher Order Frequency Response Functions, Generalized Membrane Permeability, Solution-Diffusion Model, Pore-Surface Diffusion Model, Viscous-Flow Model, Parameter Estimation, Adsorption-Kinetics, Diffusion, Systems, Mechani

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Full Text: [2006\Sep Sci Tec41, 111.pdf](2006/Sep%20Sci%20Tec41,%20111.pdf)

Abstract: A possibility of Cr(VI) removal by the adsorption method is discussed in the paper. An adsorbent were hydrogel chitosan beads are produced by the phase inversion method (by changing pH). The possibility of removing Cr(VI) ions by both pure chitosan hydrogel and its chelate compounds (chitosan cross-linked with Cu(II) and Ag(I) ions) was investigated. The adsorption proceeded from the solutions of potassium dichromate and ammonium dichromate (NH4)2Cr2O7 and K2Cr2O7. The process rates and adsorption isotherms were determined and described by relevant equations. The process rate was described by the pseudo- and second-order equations, and adsorption equilibria by the Langmuir equations. A slight advantageous change in adsorption properties of chitosan beads was revealed after cross-linking (for chromium concentration up to 10 g/dm3). A maximum adsorption was 1.1 g(Cr)/g chitosan. Results of the studies show that chitosan hydrogel proves useful in the removal of Cr(VI) ions, additionally, cross-linking with Cu(II) and Ag(I) ions has an advantageous effect in the case of low-concentrated solutions.

Keywords: Chitosan, Adsorption, Cr(VI) Ions, Heavy-Metal Ions, Waste-Water, Removal, Separation, Sorbents, Equilibrium, Adsorbents, Membranes, Sorption, Silver

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Full Text: [2006\Sep Sci Tec41, 149.pdf](2006/Sep%20Sci%20Tec41,%20149.pdf)

Abstract: Uptake of nickel and benzene from dilute single-solute solutions, mimicking wastewater with low concentrations of heavy metals or volatile organic compounds, was examined using activated carbons with similar good surface properties (BET surface area of approximate to 1100 m2/g). They were developed through H3PO4 acid activation of giant reed (Arundo donax L.) under flowing air or N2. The carbons obtained in air proved more effective to capture Ni(II) ions under pre-established equilibrium conditions. Inversely, the N2-derived carbons exhibited a better ability for benzene adsorption. The behavior was related to the smaller total content of acidic/polar surface oxygen functionalities of the carbons developed under N2 (1.9 meq/g), compared to that of the air-derived ones (3.3 meq/g). Two-, three-parameter models described properly the isotherms, predicting similar maximum adsorption capacities (Xm) for the investigated systems. The Xm parameter in the Langmuir’s model was 0.44 mmol/g for the adsorption of Ni(II) ions on the air-derived carbons, and 0.45 mmol/g for benzene adsorption on those obtained in N2. Present results highlight the relevance of the surface chemistry developed upon activation to optimize the performance of activated carbons for wastewater treatment according to the pollutants’ nature.

Keywords: Wastewater Treatment, Activated Carbons, Heavy Metals, Volatile Organic Compounds, Lignocellulosic Materials, Functional-Groups, Phosphoric-Acid, Arundo-Donax, Shell, Dioxide, Metals, Lignin, Ions, Wood

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Full Text: [2006\Sep Sci Tec41, 501.pdf](2006/Sep%20Sci%20Tec41,%20501.pdf)

Abstract: Activated carbons offer an efficient option for the removal of organic and inorganic contaminants from water. However, due to its high costs and difficulty in the regeneration, other low cost adsorbents have been used. In this work, the adsorption capacity of an adsorbent carbon with high iron oxides concentration was compared with that of a commercial activated carbon in the removal of a leather dye from an aqueous solution. The adsorbents were characterized using SEM/EDAX analysis and BET surface area. The capacity of adsorption of the adsorbents was evaluated through the static method at 25°C. The results showed that the color removal was due to the adsorption and precipitation of the dye on the surface of the solids. The adsorption equilibrium was described according to the linear model for the adsorbent carbon and the equilibrium constant was 0.02 L g-1. The equilibrium of adsorption on activated carbon exhibited a behavior typical of the Langmuir isotherm and the monolayer coverage was 24.33 mg g-1. A mathematical model was proposed to describe the dynamics of the color removal using a fixed bed considering that the color removal is due to the adsorption and the precipitation of the dye on the adsorbent.

Keywords: Activated Carbons, Adsorption, Color Removal, Dye, Ions, Iron, Langmuir, Modeling, Removal, Surface, Water, Water Treatment

? Onyango, M.S., Kojima, Y., Kumar, A., Kuchar, D., Kubota, M. and Matsuda, H. (2006), Uptake of fluoride by Al3+ pretreated low-silica synthetic zeolites: Adsorption equilibrium and rate studies. *Separation Science and Technology*, **41** (4), 683-704.

Full Text: [2006\Sep Sci Tec41, 683.pdf](2006/Sep%20Sci%20Tec41,%20683.pdf)

Abstract: The removal of fluoride from single component aqueous solution using Al3+ - pretreated low-silica synthetic zeolites (Al-Na-HUD, Al-HUD, Al-F9, and Al-A4) was studied. The effects of adsorbent mass, initial solution pH, and initial concentration on fluoride removal in a batch system were evaluated. Equilibrium data were simulated using simple isotherms such as the Freundlich (F), Langmuir-Freundlich (LF), Redlich-Peterson (RP) and Dubinin-Radushkevitch (DR) isotherms. From the DR model, initial pH effects and desorption studies, it was considered that the fluoride adsorption onto the zeolites proceeded by ion-exchange or chemisorption mechanism. In interpreting the kinetic results, reaction kinetics (using Elovich equation) and mass transfer processes (both external mass transfer and intraparticle diffusion) were considered. Equilibrium and kinetic results of fluoride adsorption onto the adsorbents demonstrated the following order of performance: Al-Na-HUD>Al-F9> Al-HUD>Al-A4.

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Full Text: [2006\Sep Sci Tec41, 733.pdf](2006/Sep%20Sci%20Tec41,%20733.pdf)

Abstract: The organo-clay used in this work was prepared from a Na-montmorillonite (Wyoming-USA deposit) by treatment with water solution of hexadecyltrimethylammonium cations. As organo-clays exhibit strong sorptive capabilities for organic molecules, 2-mercapto-5-amino-1,3,4-thiadiazole organofunctional groups, with potential usefulness in chemical analysis, were incorporated on its solid surface. The physically adsorbed reagent did not present any restrictions in coordinating with several metal ions on the surface. The resultant organo-clay complex exhibited strong sorptive capability for removing mercury ions from water in which other metals and ions were also present. The purpose of this work is to study the selective separation of mercury(II) from aqueous solution using the organo-clay complex, measured by batch and chromatographic column techniques, and its application as preconcentration agent in a chemically modified carbon paste electrode for determination of mercury(II) in aqueous solution.

Keywords: 2-Mercaptoimidazole, Adsorption, Adsorption, Analysis, Carbon, Carbon Paste Electrode, Chemical, Chemical Analysis, Clay, Complex, Complexes, Determination, Hexadecyltrimethylammonium, Industrial Wastewaters, Inorgano-Organo-Clays, Ion-Exchange Voltammetry, Mercury, Mercury(II), Metal Ions, Metals, Modified, Modified Clay, Modified Electrodes, Montmorillonite, Montmorillonite, Organic, Organic Molecules, Organo-Clay, Organo-Clays, Organoclay, Organoclays, Preconcentration, Priority Pollutants, Selective, Separation, Silica-Gel Surface, Sorption, Surface, Techniques, Treatment, Water

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Full Text: [2006\Sep Sci Tec41, 747.pdf](2006/Sep%20Sci%20Tec41,%20747.pdf)

Abstract: Rice bran, an agricultural by-product, was used for the removal of zinc ions from aqueous solution. The work considered the determination of zinc-biomass equilibrium data in batch system. These studies were carried out in order to determine some operational parameters of zinc sorption such as the time required for the Zinc-biosorbent equilibrium, the effects of biomass particle size, pH, and temperature. The results showed that pH has an importance effect on zinc biosorption capacity. The biosorbent size also affects the zinc biosorption capacity. The sorption process follows pseudo-second-order kinetics. The intraparticle diffusion may be the rate-controlling step involved in the adsorption zinc ions onto the rice bran up to 30 min. The equilibrium data could be best fitted by the Langmuir sorption isotherm equation over the entire concentration range (40-160 mg/dm3). Thermodynamic parameters, such as Delta G degrees, Delta H degrees, Delta S degrees, have been calculated. The thermodynamics of zinc ion/rice bran system indicate spontaneous and endothermic nature of the process.

Keywords: Biosorption, Zinc(II), Rice Bran, Adsorption Kinetic, Langmuir Isotherm, Thermodynamic Property, Metal-Ions, Tree Fern, Sorption, Removal, Copper, Chromium(III), Biomass, Wastes, Nickel

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Full Text: [2006\Sep Sci Tec41, 943.pdf](2006/Sep%20Sci%20Tec41,%20943.pdf)

Abstract: The removal of iron and manganese from ground water is an important step for producing safe drinking water. A detailed investigation of the sorption of iron and manganese from ground water onto maize cobs is reported. This work deals with determination of adsorption equilibrium isotherms, kinetic, and fixed bed column studies. Results of Freundlich and Langmiur parameters revealed the favorability of maize cobs for adsorption of iron and manganese ions. Kinetic studies were carried out using from ground water samples (El-Mina Governorate, Egypt). From the kinetic studies, a model is proposed to determine the external mass transfer (Ks) which can be correlated by the following equation Ks =A (mass) B . where A and B are constants. During the fixed bed column studies, the effect of process variables such as bed height, flow rate, initial concentration, and percentage breakthrough has been investigated. A simplified design method, namely, the bed depth service time (BDST) model has been applied to the experimental data and the results of this analysis are presented. The mechanism of the metal ion sorption on maize cobs was also investigated. Both the calorific values and differential thermal analysis (DTA) data proved that the loaded maize cobs can be used as solid fuel. Pretences of iron and manganese salts catalyze the thermal decomposition reaction toward more flammable gases, which increase their calorific values. The loaded maize cobs are considered a new potential source for energy conversion.

Keywords: Adsorption, Adsorption Equilibrium Isotherms, Aqueous-Solutions, Bagasse Pith, BDST, Diffusion, Dyes, Fired Bed Column Studies, Ground Water, Iron And Manganese Removal, Kinetic Studies, Maize Cobs, Palm-Fruit Bunch, Pore, Removal, Sorption

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Full Text: [2006\Sep Sci Tec41, 1829.pdf](2006/Sep%20Sci%20Tec41,%201829.pdf)

Abstract: In this study surface modified SBA-15, coated with octadecyltrichlorosilane (C18), is considered as an alternative adsorbent for metal ions in water. The SBA-C18 was loaded with Bis(2,4,4-trimethylpentyl) phosphinic acid (cyanex 272) as the metal ion extractant. The adsorption characteristics of phosphinic acid loaded SBA-C18 were evaluated for Cu(II) and Zn(II) ions in aqueous solution. Adsorption tests indicated that a contact time of 1 hour was sufficient for adsorption equilibrium to occur. The pH 1/2 values of Zn(II) and Cu(II) onto SBA-C18, were found to be similar to published data for levextrel ion exchange resins and around 1 pH unit lower than published solvent extraction data for cyanex 272 in xylene.

Keywords: Acid, Adsorbent, Adsorption, Adsorption Equilibrium, C18, Equilibrium, Extraction, Ion, Ion Exchange, Mesoporous Silicate, Metal Ions, Modification, Modified, Molecular-Sieves, pH, Resins, SBA-15, Separation, Silicate, Solvent Extraction, Surface, Surface Modification, Water, Zn(II)

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Full Text: [2006\Sep Sci Tec41, 1881.pdf](2006/Sep%20Sci%20Tec41,%201881.pdf)

Abstract: A comparative study of the adsorbents prepared from several industrial wastes for the removal of Pb2+ has been carried out. Fertilizer industry waste viz. carbon slurry and steel plant wastes viz. blast furnace (B.F.) slag, dust, and sludge were investigated as low-cost adsorbents after proper treatment in the present study. The adsorption of Pb2+ on different adsorbents has been found in the order: B.F. sludge > B.F. dust > B.F. slag > carbonaceous adsorbent. The least adsorption of Pb2+ on carbonaceous adsorbent even having high porosity and consequently greater surface area as compared to other three adsorbents, indicates that surface area and porosity are not important factors for Pb2+ removal from aqueous solutions. The adsorption of Pb2+ has been studied as a function of contact time, concentration, and temperature. The adsorption has been found to be exothermic, and the data conform to the Langmuir equation. The kinetic results reveal that the present adsorption system follows Lagergren’s first order rate equation. Since all three waste products from the steel industry show higher potential to remove lead from water, therefore, it is suggested that these metallurgical wastes can be fruitfully employed as low-cost adsorbents for effluent treatment containing toxic metal ions.

Keywords: Steel Plant Wastes, Fertilizer Industry Waste, Low-Cost Adsorbents, Lead Removal, Equilibrium and Kinetic Studies, Blast-Furnace Sludge, Low-Cost Adsorbent, Heavy-Metals, Sorption, Water, Slag, Adsorption, Peat

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Full Text: [2006\Sep Sci Tec41, 2629.pdf](2006/Sep%20Sci%20Tec41,%202629.pdf)

Abstract: The Stokes-Robinson modification of the Brunauer-Emmett-Teller (BET) adsorption isotherm is used to calculate the liquidus curve of NaNO3(aq) including the eutectic point and metastable phases. The method described here represents a simplified approach to predict the liquidus curves with sparse information and considers the presence of several crystalline solid phases of NH4NO3.

Keywords: Absorption Isotherm, Activity Coefficients, Adsorption, Adsorption Isotherm, Adsorption Isotherm Model, Aqueous Electrolyte, BET Model, Brunauer-Emmett-Teller (BET), Concentrated-Solutions, Electrolytes, Eutectic, Information, Isotherm, Model, Modification, Modified, Predict, Salt, Water

? Srivastava, V.C., Mall, I.D. and Mishra, I.M. (2006), Modelling individual and competitive adsorption of cadmium(II) and zinc(II) metal ions from aqueous solution onto bagasse fly ash. *Separation Science and Technology*, **41** (12), 2685-2710.

Full Text: [2006\Sep Sci Tec41, 2685.pdf](2006/Sep%20Sci%20Tec41,%202685.pdf)

Abstract: The present study deals with the competitive adsorption of cadmium (Cd(II)) and zinc (Zn(II)) ions onto bagasse fly ash (BFA) from binary systems. BFA is a waste obtained from the bagasse-fired boilers of sugar mills. The initial pH approximate to 6.0 is found to be the optimum for the individual removal of Cd(II) and Zn(II) ions by BFA. The equilibrium adsorption data were obtained at different initial concentrations (C-0 = 10-100 mg/l), 5 h contact time, 30°C temperature, BFA dosage of 10 mg/l at pH(0) = 6. The Redlich-Peterson (R-P) and the Freundlich models represent the single ion equilibrium adsorption data better than the Langmuir model. The adsorption capacities in the binary-metal mixtures are in the order Zn(II)> Cd(II) and is in agreement with the single-component adsorption data. The equilibrium metal removal decreases with increasing concentrations of the other metal ion and the combined action of Cd(II) and Zn(II) ions on BFA is found to be antagonistic. Equilibrium isotherms for the binary adsorption of Cd(II) and Zn(II) ions on BFA have been analyzed by non-modified Langmuir, modified Langmuir, extended-Langmuir, Sheindorf-Rebuhn-Sheintuch (SRS), non-modified R-P and modified R-P adsorption models. The isotherm model fitting has been done by minimizing the Marquardt’s percent standard deviation (MPSD) error function using MS Excel. The SRS model satisfactory fits for most of the adsorption equilibrium data of Cd(II) and Zn(II) ions onto BFA.

Keywords: Binary Adsorption, Bagasse Fly Ash (BFA), Simultaneous Metal Removal, Multi-Component Isotherms, Cadmium(II), Zinc(II), Equilibrium Isotherm Analyses, Freundlich-Type Isotherm, Activated Carbon, Multicomponent Isotherm, Removal, Biosorption, Waste, Biomass, Zn(II), Water

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Full Text: [2006\Sep Sci Tec41, 2989.pdf](2006/Sep%20Sci%20Tec41,%202989.pdf)

Abstract: A modified fungal biomass was prepared through the adsorption of polyethylenimine (PEI) and subsequent crosslinking with glutaraldehyde on the biomass surface. FTIR result verified that the amine groups were introduced on the biomass surface. As a large number of amine groups are present on the biomass surface and can be protonated in solution, the modified biomass was positively charged at pH < 10.3. The modified biomass was used as an adsorbent to remove humic acid in a series of batch adsorption experiments. The amount of humic acid adsorbed on the biosorbent decreased with increasing solution pH, and the electrostatic interaction between the positive protonated amine groups on the biomass surface and the negative carboxyl groups in the humic acid molecules played an important role in humic acid adsorption. The time-dependent sorption of humic acid on the biomass can be described well by the Fickian diffusion model at the initial stage and the pseudo-second-order equation over 10 h. Using the Langmuir adsorption isotherm, the maximum sorption capacity of the modified biomass for humic acid at pH 5 was 96.5 mg/g. The desorption experiments showed that the humic acid loaded biomass could be easily regenerated in a 0.1 M NaOH solution, and the regenerated biomass possessed good adsorption capacity up to the fifth cycle. The PEI-modified biomass with polyamine chains shows the potential for application in water treatment for the removal of humic substances.

Keywords: PEI-Modified Biomass, Zeta Potential, Adsorption Behavior, Humic Acid, Ftir Analysis, Aminated Polyacrylonitrile Fibers, Natural Organic-Matter, Mineral Particles, Metal-Ions, Adsorption, Sorption, Ultrafiltration, Biosorption, Mechanisms, Trivalent

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Full Text: [2006\Sep Sci Tec41, 3485.pdf](2006/Sep%20Sci%20Tec41,%203485.pdf), [2006\Sep Sci Tec-Wen.pdf](2006/Sep%20Sci%20Tec-Wen.pdf)

Abstract: The adsorption of ammonium ions onto a Chinese natural zeolite in an agitated batch adsorber was studied. A trial-and-error non-linear method was developed to examine two widely used isotherms, the Langmuir and Freundlich. The data gained from the adsorption system fitted the Freundlich isotherm better. An ion exchange model, describing the relationship among the total metal ions in the solution, NH4t removed from the solution, and ions initially released from the zeolite, was developed for the adsorption system. In addition, a parameter of the ion exchange potential was defined to describe the adsorption mechanism. Ion exchange was the main mechanism that accounted for the adsorption of ammonium ions onto the Chinese natural zeolite.

Keywords: Natural Zeolite, Adsorption, Isotherm, Ion Exchange

? Abu Al-Rub, F.A. (2006), Biosorption of zinc on palm tree leaves: Equilibrium, kinetics, and thermodynamics studies. *Separation Science and Technology*, **41** (15), 3499-3515.

Full Text: [2006\Sep Sci Tec41, 3499.pdf](2006/Sep%20Sci%20Tec41,%203499.pdf)

Abstract: The efficiency of using palm tree leaves to remove zinc ions from aqueous solution was studied. Adsorption isotherms, kinetics, and thermodynamics studies were conducted. The influence of different experimental parameters, such as equilibrium pH, shaking rate, temperature, and the presence of other pollutants such as chelating agents on the biosorption of zinc on palm tree leaves was investigated.

Batch biosorption experiments showed that palm tree leaves used in this study proved to be suitable for the removal of zinc from dilute solutions where a maximum uptake capacity of 14.7 mg/g was obtained at 25°C. Zinc biosorption on palm tree leaves was found to be highly pH dependent. The biosorption process was found to be rapid with 90% of the adsorption completed in about 10 min. Dynamics studies of the biosorption of zinc on palm tree leaves showed that the biosorption process followed the pseudo second-order kinetics with little intraparticle diffusion mechanism contribution. The equilibrium results indicated that zinc biosorption on palm tree leaves could be described by the Langmuir, Freundlich, Gin et al., and Sips models. Using the Langmuir equilibrium constants obtained at different temperatures, the thermodynamics properties of the biosorption (Delta G(0), Delta H-0, and Delta S-0) were also determined. The values of these parameters indicated the spontaneous and endothermic nature of zinc biosorption on palm tree leaves.

Keywords: Biosorption, Zinc, Palm Tree Leaves, Isotherms, Aqueous-Solution, Heavy-Metals, Chlorella-Vulgaris, Activated Carbon, Lead Ions, Removal, Sorption, Cadmium, Adsorption, Copper

? Özcan, A.S., Özcan, A., Tunali, S., Akar, T., Kiran, I. and Gedikbey, T. (2007), Adsorption potential of lead(II) ions from aqueous solutions onto *Capsicum annuum* seeds. *Separation Science and Technology*, **42** (1), 137-151.

Full Text: [2007\Sep Sci Tec42, 137.pdf](2007/Sep%20Sci%20Tec42,%20137.pdf)

Abstract: The purpose of this work was to evaluate the adsorption potential of Capsicum annumn seeds, in a batch system for the removal of lead(H) ions from aqueous solutions. The experimental results showed that this agricultural by-product was effective in removing lead(H) ions. The FT-IR analysis indicated that the mechanism involved in adsorption of lead(H) ions by seeds of C. annuum was mainly attributed to lead(H) binding of amino and hydroxyl groups. Adsorption equilibrium approached within 40 min. The adsorption data fitted well to the Langmuir isotherm model. The maximum adsorption capacity (qmax) was 1.87×10-4 mol g-1. Pseudo-second-order kinetic model was applicable to all the adsorption data over the entire time range. The thermodynamic parameters indicated that the adsorption process is spontaneous since Gibbs free energy values are negative, which are between -26.92 and -30.77 kJ mol at the temperature range of 20-50°C.

Keywords: Agricultural By-Products, Adsorption, Heavy Metals, Isotherm, Kinetics, Capsicum Annuum Seeds, Heavy-Metals, Removal, Biosorption, Biomass, Equilibrium, Copper(II), Biosorbent, Kinetics, Pb(II), Water

? Liu, Y., Xiao, D. and Li, H. (2007), Kinetics and thermodynamics of lead(II) adsorption on vermiculite. *Separation Science and Technology*, **42** (1), 185-202.

Full Text: [2007\Sep Sci Tec42, 185.pdf](2007/Sep%20Sci%20Tec42,%20185.pdf)

Abstract: The kinetics and thermodynamics of Pb(II) adsorption on vermiculite have been studied by the sets of experiments at various conditions (temperature, initial lead concentration and adsorption time). The structures of the vermiculite before and after Pb(II) adsorption were measured using X-ray diffraction (XRD), thermogravimetric analysis (TA), and X-ray photoelectron spectroscopy (XPS). Adsorption of Pb(II) was strongly affected by pH. First order kinetics model best described the reaction rate, and the adsorption capacity calculated by the model was consistent with that actual measurement. Isotherms for the adsorption of Pb(II) on vermiculite were developed and the equilibrium data fitted well to the Langmuir and Freundlich models. Thermodynamic parameters such as enthalpy, entropy, and free energy were calculated using the Van’t Hoff equations. The thermodynamics of Pb(II) on vermiculite indicates the spontaneous and endothermic nature of adsorption. Quantitative desorption of Pb(II) from vermiculite was found to be more than 40% which facilitates the sorption of metal by ion exchange.

Keywords: Kinetics, Thermodynamics, Adsorption, Lead, Vermiculite, Bagasse Fly-Ash, Sugar-Industry Waste, Aqueous-Solutions, Activated Carbon, Metal Removal, Water, Cadmium, Ions, Biosorption, Equilibrium

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Full Text: [2007\Sep Sci Tec42, 299.pdf](2007/Sep%20Sci%20Tec42,%20299.pdf)

Abstract: The selectivity of a Mexican surfactant-modified clinoptilolite-rich tuff to retain azo dyes (red-40, yellow-5 and a mixture of them) from aqueous solutions has been investigated. The zeolitic material was modified with hexadecyltrimethylammonium bromide and then left in contact with azo dyes. The uptake was determined at different contact times and concentrations of dyes solutions. First order Elovich, and pseudo second order models as well as the lineal, Langmuir, and Freundlich isotherms were used to describe the experimental data. It was found that in single and binary solutions, under the experimental conditions, the modified zeolitic material retain preferentially the dye red-40 in comparison to yellow-5. The best models to describe the reaction rate and the sorption of azo dyes red-40 and yellow-5 by Mexican surfactant modified clinoptilolite-rich tuff were pseudo-second order and Langmuir models, respectively. These results show that surfactant modified clinoptilolite-rich tuff from Villa de Reyes (San Luis Potosi, Mexico) could be considered as a potential adsorbent of azo dyes from aqueous solutions.

Keywords: Dye, Modified Zeolitic Rock, Sorption, Aqueous-Solutions, Reactive Dyes, Color Removal, Adsorption, Hexadecyltrimethylammonium, Sepiolite, Zeolites, Kinetics, Cadmium

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Full Text: [2007\Sep Sci Tec42, 591.pdf](2007/Sep%20Sci%20Tec42,%20591.pdf)

Abstract: The aniline moiety was covalently grafted onto silica gel surface. The modified silica gel with aniline groups (SiAn) was used for removal of Cu(II), Fe(III), and Cr(III) ions from aqueous solution and industrial effluents using a batch adsorption procedure. The maximum adsorption of the transition metal ions took place at pH 4.5. The adsorption kinetics for all the adsorbates fitted better the pseudo second-order kinetic model, obtaining the following adsorption rate constants (k(2)): 1.233×10-2, 1.902×10-2, and 8.320×10-3 g.mg-1 min-1 for Cr(III), Cu(II), and Fe(III), respectively. The adsorption of these transition metal ions were fitted to Langmuir, Freundlich, Sips, and Redlich-Peterson isotherm models, however, the best isotherm model fitting which presented a lower difference of the q (amount adsorbed per gram of adsorbent) calculated by the model from the experimentally measured, was achieved by using the Sips model for all adsorbates chosen. The SiAn adsorbent was also employed for the removal of the transition metal ions Cr(III) (95%), Cu(II) (95%), and Fe(III) (94%) from industrial effluents, using the batch adsorption procedure.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Rate, Aniline, Batch Adsorption Procedure, Biosorption, Chemically Modified Silica Gel, Chitosan, Copper, Effluents, Equilibrium, Freundlich, Gel, Grafted, Groups, Heavy-Metal Removal, Industrial, Industrial Effluents, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetics, Kinetics of Adsorption, Langmuir, Mesoporous Silicas, Metal, Metal Ions, Model, Models, Modified, Natural-Waters, pH, Pseudo-Second-Order, Removal, Silica, Silica Gel, Sorbent, Surface, Transition Metal, Treatment of Effluents

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Full Text: [2007\Sep Sci Tec42, 611.pdf](2007/Sep%20Sci%20Tec42,%20611.pdf)

Abstract: Equilibrium isotherms of sterol adsorption on zeolite show the characteristics of irreversible equilibrium adsorption. First order and second order surface adsorption control mechanisms as well as micropore diffusion control model failed to satisfactorily describe the kinetics of sterol adsorption on zeolite. From the analysis of adsorption data, it was found that macropore diffusion control model satisfactorily describes the kinetics of sterol adsorption on zeolite. The effect of temperature on the diffusivity during adsorption was found to conform to the Eyring equation. It was shown that a change in temperature has a negligible effect on the selectivity of sterol adsorption on zeolite.

Keywords: Adsorption, Analysis, Beta-Sitosterol, Beta-Sitosterol, Campesterol, Control, Diffusion, Equilibrium, Isotherms, Kinetic Model, Kinetics, Mechanisms, Model, Purification, Selectivity, Separation, Speed Countercurrent Chromatography, Sterol, Surface, Temperature, Zeolite

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Full Text: [2007\Sep Sci Tec42, 653.pdf](2007/Sep%20Sci%20Tec42,%20653.pdf)

Abstract: Bench scale batch adsorption experiments were performed, aiming at the removal of the Pb2+ ions from aqueous solutions and water samples by fine powdered Limestone (LS) as an effective inorganic sorbent, which is inexpensive, widespread, and cheap. The main parameters (i.e., solution pH, sorbent and lead concentrations, stirring times, and temperature) influencing the sorption process, in addition to the effect of some foreign ions, were investigated. The results obtained stated that the sorption of Pb2+ ions onto LS is well described by Freundlich model and deviated from that of Langmuir over the concentration range studied. Under the optimum experimental conditions employed, the removal of ca. 100% of Pb2+ ions was attained. The procedure was successfully applied to the removal of lead from aqueous and different natural water samples. Moreover, the adsorption mechanism is suggested.

Keywords: Lead, Sorption, Powdered Limestone, Natural Waters, Heavy-Metal Removal, Aqueous-Solutions, Adsorption, Calcite, Ions, Effluents, Wastes, Hydroxyapatite, Adsorbents, Retention

Full Text: [2007\Sep Sci Tec42, 653.pdf](2007/Sep%20Sci%20Tec42,%20653.pdf)

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Full Text: [2007\Sep Sci Tec42, 993.pdf](2007/Sep%20Sci%20Tec42,%20993.pdf)

Abstract: The current research focuses on removal of arsenite ions from aqueous solutions by a new adsorbent, surfactant modified akaganeite (Ak(m)), prepared after the adsorption of the cationic surfactant, hexadecyl trimethyl ammonium bromide (N-Cetyl-N,N,N-Trimethylammonium Bromide) onto akaganeite. The new adsorbent was investigated with Fourier transform infrared spectra and X-ray photoelectron spectroscopy methods for a better understanding of the effects of surface properties on arsenite adsorption. Surfactant modified akaganeite was found to be an effective adsorbent for the removal of arsenite ions from aqueous systems. It presented a significantly higher arsenite adsorption capacity than the pure nanocrystalline akaganeite. Kinetics of adsorption obeys a second-order rate equation. The maximum adsorption capacity was found to 328.3 mg g-1 over a wide pH range significantly higher than those of other adsorbents reported.

Keywords: Activated Alumina, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Akaganeite, Ammonium, Aqueous-Solutions, Arsenate, Arsenite, Arsenite Removal, Biosorption, Capacity, Cationic Surfactant, Effects, Equilibrium, Iron Oxide Hydroxide, Mechanisms, Methods, Modified, Modified Clinoptilolite, Nanocrystalline, pH, Photoelectron Spectroscopy, Process Mechanism, Properties, Range, Rate Equation, Removal, Research, Spectroscopy, Surface, Surface Properties, Surfactant, Surfactant-Modified Adsorbent, Titanium-Dioxide, X-Ray Photoelectron Spectroscopy

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Full Text: [2007\Sep Sci Tec42, 1013.pdf](2007/Sep%20Sci%20Tec42,%201013.pdf)

Abstract: In the present study, batch kinetic tests have been performed for boron removal from model solutions using boron selective ion exchange resins Diaion CRB 02, Dowex (XUS 43594.00) and Purolite S 108. Several kinetic models have been used to evaluate the sorption kinetics of boron by means of a well mixed stirred system, diffusional models, pseudo-first-order, and pseudo-second-order kinetic models. The mass transfer model, based on a well stirred system including maximum capacity (Q(m), mg/g) and Langmuir constant (b, L/mg) values obtained from Langmuir isotherms, has been used to obtain predictive concentration changes against time. The experimental results have been used to compare with the modelling data for different ionic strength media.

Keywords: Boron, Capacity, Concentration, Geothermal Waste-Water, Ion, Ion Exchange, Ion-Exchange, Ionic Strength, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherms, Mass Transfer, Media, Model, Modelling, Models, Power-Plant, Pseudo Second Order, Pseudo-Second-Order, Recovery, Removal, Resins, Selective, Separation, Sorption, Sorption Kinetics, Sorption-Elution, Strength, Tests, Transfer, Water

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Full Text: [2007\Sep Sci Tec42, 1215.pdf](2007/Sep%20Sci%20Tec42,%201215.pdf)

Abstract: The potential to remove copper(II) ions from aqueous solutions using Na-mordenite, a common zeolite mineral, was thoroughly investigated. The effects of relevant parameters solution pH, adsorbent dose, ionic strength, and temperature on copper(II) adsorption capacity were examined. The sorption data followed the Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) isotherms. The maximum sorption capacity was found to be 10.69 mg/g at pH 6, initial concentration of 40 mg/dm3, and temperature of 40°C. Different thermodynamic parameters viz., changes in standard free energy (ΔG°), enthalry (ΔH°), and entropy (ΔS°) have also been evaluated and the results show that the sorption process was spontaneous and endothermic in nature. The dynamics of the sorption process were studied and the values of rate constant of adsorption, rate constant of intraparticle diffusion were calculated. The activation energy (E-a) was found to be 11.25 kJ/mol in the present study, indicating a chemical sorption process involving weak interactions between sorbent and sorbate. The interaction between copper(II) ions and Na-mordenite is mainly attributable to ion exchange. The sorption capacity increased with the increase of solution pH and the decrease of ionic strength and adsorbent dose. The Na-mordenite can be used to separate copper(II) ions from aqueous solutions.

Keywords: Adsorption, Copper(II), Na-Mordenite, Sorption Mechanism, Wastewater Treatment, Sorption Isotherms, Activated Carbon, Waste-Water, Tree Fern, Adsorption, Equilibrium, Zeolites, Biosorbents, Kinetics, Sawdust

? Bhatnagar, A., Minocha, A.K., Jeon, B.H. and Park, J.M. (2007), Adsorptive removal of cobalt from aqueous solutions by utilizing industrial waste and its cement fixation. *Separation Science and Technology*, **42** (6), 1255-1266.

Full Text: [2007\Sep Sci Tec42, 1255.pdf](2007/Sep%20Sci%20Tec42,%201255.pdf)

Abstract: In the present study, the adsorption potential of battery industry waste as adsorbent has been investigated for the removal of cobalt from aqueous solutions. The results have shown that the prepared adsorbent adsorbs cobalt to a sufficient extent (35 mg/g). The adsorption of cobalt has been studied on this battery industry waste as a function of contact time, concentration, and temperature by the batch method. The adsorption has been found to be endothermic and the data conform to the Langmuir equation. The analysis of kinetic data indicates that adsorption is a first order process and pore-diffusion controlled.

Further, the metal-laden adsorbent was immobilized into cement for ultimate disposal and no significant leaching was observed from the stabilized products. Thus, the present study clearly reveals that battery industry waste can be fruitfully employed in treating industrial effluents containing toxic metal ions.

The proposed technology (utilization of industrial wastes for effluent treatment and then ultimate disposal of adsorbents laden with pollutants in cementitious materials by fixation) provides a twofold aim of wastewater treatment and solid waste management.

Keywords: Industrial Waste Minimization, Battery Industry Waste, Adsorbent, Cobalt Removal, Water Treatment, Blast-Furnace Sludge, Sorption, Adsorbent, Kinetics, Water, Lead(II), Models, Ions, Peat, Slag

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Full Text: [2007\Sep Sci Tec42, 2019.pdf](2007/Sep%20Sci%20Tec42,%202019.pdf)

Abstract: This study is aimed at the effectiveness of an adsorbent prepared from jackfruit peel (artocarpus heterophyllus), an agricultural waste, for the removal of phenol, 2-chlorophenol, 4-chlorophenol, 2,4-dichlorophenol from aqueous solutions. Batch adsorption experiments were carried out as a function of solution pH, contact time, phenol concentration, adsorbent dose, and temperature. The adsorption equilibrium was reached in 5 h. The order of removal was found to be 2,4-dichlorophenol > 4-chlorophenol > 2-chlorophenol > phenol. The Freundlich and Langmuir isotherm models were applied to the equilibrium data. The maximum sorption capacities for phenol, 2-chlorophenol, 4-chlorophenol, and 2,4-dichlorophenol were found to be 144.9 mg/g, 243.9 mg/g, 277.7 mg/g, and 400.0 mg/g respectively. The removal of phenols was found to be most effective at lower pH. Kinetic data of the adsorption process could fit a pseudo second order rate equation. An attempt was also made to understand the mechanism of phenol adsorption. The results reveal that the activated carbon prepared can be economical for the removal of phenols compared to many other reported adsorbents.

Keywords: 2,4-Dichlorophenol, 2-Chlorophenol, 4-Chlorophenol, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Process, Agricultural, Agricultural Solid-Waste, Agricultural Waste, Aqueous Solution, Aqueous Solutions, Carbon, Carbon Black, Chlorophenols, Coir Pith, Concentration, Contact Time, Dyes, Effective, Effectiveness, Equilibrium, Equilibrium Data, Equilibrium Studies, Freundlich, Function, Isotherm, Isotherm Models, Jackfruit Peel, Langmuir, Langmuir Isotherm, Langmuir-Isotherm, Made, Mass-Transfer, Maximum Sorption, Mechanism, Models, Order, Oxidation, pH, Phenol, Phenol Adsorption, Phenols, Process, Pseudo Second Order, Pseudo-Second-Order, Rate, Rate Equation, Removal, Removal of Phenol, Second Order, Shell, Solution pH, Solutions, Sorption, Surface-Chemistry, Temperature, Waste

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Full Text: [2007\Sep Sci Tec42, 2705.pdf](2007/Sep%20Sci%20Tec42,%202705.pdf)

Abstract: The adsorption equilibrium of a wide range of phosphorus species by an aluminum-based water treatment sludge (Al-WTS) was examined in this study. Four kinds of adsorption-isotherm models, namely Langmuir, Freundlich, Temkin, and Dubinin-Radushkevich, were used to fit the adsorption equilibrium data. In order to optimize the adsorption-isotherm model, correlation coefficient (R-2) and four error functions were employed to facilitate the evaluation of fitting accuracy. Experiments have demonstrated that the Al-WTS may be an excellent raw material to adsorb P in a polluted aqueous environment with adsorption ability in the order of KH2PO4 (orthoP) > Na(PO3)6 (poly-P) > C10H14N5O7P center dot H2O (organic-P). More importantly, this study provides an entire comparison of the four isotherms in describing the P adsorption behavior. By considering both the standard least-square based R-2 and the results of four error functions analysis, this study reveals that the Freundlich isotherm appears to be the best model to fit the experimental equilibrium data. Langmuir and Temkin isotherms are also good models in current experimental conditions while the Dubinin-Radushkevich isotherm poorly described the adsorption behavior. The error analysis in this study provides vital evidence to reflect its role in facilitating the optimization in the adsorption isotherm study. Obviously, R-2 seems inadequate in optimizing multi-isotherm models due to its inherent bias resulting from the least-squares linearization.

Keywords: Adsorption, Aluminum, Disposal, Drinking Water Treatment Sludge, Phosphorus Removal, Reuse, Wastewater Treatment, Treatment Residuals, Waste-Water, Reduce Phosphorus, Removal, Adsorption, Sorption, Wastewaters, Mechanisms, Retention, Capacity

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Full Text: [2007\Sep Sci Tec42, 3187.pdf](2007/Sep%20Sci%20Tec42,%203187.pdf)

Abstract: The adsorption of aqueous organic pollutants, i.e., phenol, monochlorophenols (2- and 4-), and dichlorophenols (2,4- and 3,5-) on natural Jordanian zeolitic tuff was studied. Three simplified kinetic models, viz., pseudo-first order, pseudo-second order, and intraparticle diffusion models were used to fit the kinetics data. The results revealed that at earlier stages of adsorption of phenols onto zeolite, the pseudo-second order and the bulk diffusion rate constants are dependent on the acidity and the hydrophobicity of phenols. Whereas at later stages of adsorption, the adsorption capacity and the intraparticle diffusion rate constants are affected by the molecular size and the extent of dissociation of phenols.

Keywords: Acidity, Adsorption, Adsorption Capacity, Aqueous-Solutions, Basic-Dyes, Behavior, Capacity, Chlorophenols, Constants, Diffusion, Diffusion Models, Diffusion Rate, Dissociation, Hydrophobicity, Intraparticle, Intraparticle Diffusion, Ions, Kinetic, Kinetic Models, Kinetic-Models, Kinetics, Models, Monochlorophenols, Natural, Natural Zeolite, Order, Organic, Organic Pollutants, Peat, Phenol, Phenol, Phenols, Pollutants, Pseudo Second Order, Pseudo-First and, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate, Rate Constants, Size, Sorption, Zeolite, Zeolitic Tuff

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Full Text: [2007\Sep Sci Tec42, 3363.pdf](2007/Sep%20Sci%20Tec42,%203363.pdf)

Abstract: The extent of the methylene blue (MB) adsorption from an aqueous solution is a convenient indicator in the evaluation of activated carbons. The adsorption of MB (cationic dye) from aqueous solution has been studied using twenty activated carbons. The activated carbons were prepared from acid-precipitated eucalyptus kraft lignin following a two-step process consisting of CO2 partial gasification after carbonization in N2 atmosphere. The adsorbed amount was studied as a function of the contact time, temperature, pH, concentration of adsorbate, and burn-off of the activated carbons. The equilibria results obtained in a batch contactor were fitted by the Langmuir equation. The calculated values of Delta G demonstrate that the adsorption of the dye onto these activated carbons occurs by physical adsorption. Both the apparent values of Delta H and Delta S are positive, indicating that the adsorption process is endothermic and can produce spontaneously in our experimental conditions. The kinetic study was developed using a second-order exponential decay equation and the results were correlated using the Lagergren first-order equation relative to the concentration on the solid phase. The intraparticle diffusion coefficients have been estimated on the basis of an internal diffusion controlling mechanism for the net adsorption rate.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Aqueous-Solutions, Chinese Coal, Equilibrium, Eucalyptus Kraft Lignin, Kinetics, Liquid Phase Application, Malachite Green, Methylene Blue, Methylene-Blue, Reactive Dyes, Removal, Waste-Water

? Bhattacharyya, K.G. and Sen Gupta, S. (2007), Adsorption of Co(II) from aqueous medium on natural and acid activated Kaolinite and montmorillonite. *Separation Science and Technology*, **42** (15), 3391-3418.

Full Text: [2007\Sep Sci Tec42, 3391.pdf](2007/Sep%20Sci%20Tec42,%203391.pdf)

Abstract: Hazardous metal cations enter water through the natural geochemical route or from the industrial wastes. Their separation and removal can be achieved by adsorptive accumulation of the cations on a suitable adsorbent. In the present work, toxic Co(II) ions are removed from water by accumulating them on the surface of clay minerals. Clay adsorbents are obtained from kaolinite, montmorillonite, and their acid activated forms, and are characterized with the measurement of XRD patterns, specific surface area, and cation exchange capacity. The adsorption experiments are carried out in a batch process in environments of different pH, initial Co(II) concentration, amount of clay, interaction time, and temperature. Adsorption of Co(II) on the clays increases continuously from pH 1.0 to 8.0 after which adsorption could not be carried out due to the decreasing solubility of Co(II). Under appropriate conditions, the adsorption of Co(II) is very fast at low coverage approaching equilibrium within 240 min and the interactions are best described by second order kinetics. Langmuir monolayer capacity has been computed in the range of 11.2 to 29.7 mg/g and Co(II) accumulation has the order of acid-activated montmorillonite > montmorillonite > acid activated kaolinite > kaolinite. Adsorption of Co(II) on kaolinite and acid-activated kaolinite is endothermic driven by entropy increase but the same process follows exothermically on montmorillonite and acid-activated montmorillonite supported by entropy decrease. In both cases, spontaneous adsorptive accumulation is ensured by favorable Gibbs energy decrease. It is found that acid activation enhances the adsorption capacity of kaolinite and montmorillonite.

Keywords: Acid-Activation, Adsorption, Bentonite, Cadmium, Clays, Copper, Heavy-Metals, Kaolinite, Kinetics, Low-Cost Adsorbents, Montmorillonite, Nickel Ions, Removal, Sorption, Waste-Waters

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Full Text: [2007\Sep Sci Tec42, 3465.pdf](2007/Sep%20Sci%20Tec42,%203465.pdf)

Abstract: Preparation of a high stable solvent impregnated resins (SIR) containing 1,4-dihydroxyanthraquinone (quinizarin, QNZ) was proposed using Amberlite XAD-16 beads. The SIR was applied for the separation of Cd(II), Cu(II), Ni(II), and Zn(II) in aqueous media prior to the determination by flame atomic absorption spectrometry (FAAS). The optimum conditions for batch mode extraction of the above metal ions were investigated and it was found that the sorption of these metal ions from a 1000-ml aliquots of the solution on 1.5 g of the SIR can be carried out quantitatively at pH of 9.5 and an ionic strength of 0.01 mol dm-3. The sorbed metal ions were subsequently eluted with 10 ml 2 mol dm-3 HCl and the eluent was subjected to FAAS. Beer’s law was obeyed in the range of 9×10-9 -1×10-7 mol dm-3 for Cd(II) and Zn(II), and 9×10-8 -1×10-6 mol dm-3 for Cu(II) and Ni(II) contents. Significant interference was not observed due to the various ions, which could be found in natural water samples. The practical applicability of the method was confirmed using a synthetic certificated reference material (CRM) and spiked natural water samples.

Keywords: Solvent Impregnated Resins, Quinizarin, Amberlite, XAD-16, Faas, Dye 1,4-Dihydroxyanthraquinone Quinizarin, Liquid-Liquid-Extraction, Solid-Phase Extraction, Environmental-Samples, Spectrophotometric Determination, Amberlite XAD-16, Chelating Resins, Phosphoric-Acid, Divalent Metals, Heavy-Metals

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Full Text: [2007\Sep Sci Tec42, 3623.pdf](2007/Sep%20Sci%20Tec42,%203623.pdf)

Abstract: Magnesium, nickel and cobalt hydrotalcite-like compounds (MgHT, NiHT, and CoHT), with similar M2+:Al3+ ratios were synthesized and characterized by XRD. It was confirmed from XRD that the materials have hydrotalcite-like structure. MgHT, NiHT, and CoHT were calcined and treated with fluoride solutions in a batch system. F- ions were determined in the remaining solutions using a fluoride ion selective electrode. The kinetics of the fluoride ions sorption on calcined hydrotalcite-like compounds (CHT) was best described by the pseudo-second order model and the equilibrium was reached in less than 300 minutes in all cases (MgCHT, NiCHT, and CoCHT). The sorption isotherms of the fluoride by hydrotalcite like compounds can be explained by the Langmuir-Freundlich model and, the highest fluoride sorption capacity was obtained for NiCHT (1.202 mgF/gCHT). The fluoride removal from aqueous solutions by calcined hydrotalcite-like compounds depends on the adsorption properties of the thermal decomposition products and the regeneration reaction mechanism of the hydrotalcite-like compounds.

Keywords: Activated Alumina, Adsorption, Al Hydrotalcite, Aqueous Solutions, Catalytic-Properties, Cobalt, Drinking-Water, Equilibrium, Fluoride, Hydrotalcite, Hydrotalcites, Isotherms, Kinetics, Layered Double Hydroxides, Mechanism, Mixed Oxides, Ni-Al, Nickel, Pseudo-Second Order, Removal, Sorption, Sorption

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Full Text: [2007\Sep Sci Tec42, 3657.pdf](2007/Sep%20Sci%20Tec42,%203657.pdf)

Abstract: The sorption and desorption of Eu(III) on H-APC activated carbon using a batch technique has been studied as a function of carbon type, shaking time, initial pH solution, temperature, particle size of carbon, and concentration of the adsorbent and the adsorbate. The influence of different anions and cations on adsorption has been examined. The experimental data have been analyzed by Langmuir, Freundlich, and Temkin sorption isotherm models and the adsorption data for Eu(III) onto activated carbon were better correlated to the Temkin isotherm and the maximum absorption capacities obtained was 46.5 mg g-1. Anions of phosphate, carbonate, oxalate, and acetate were found to increase the adsorption of Eu(III), whereas nitrate, chloride and all studied cations, potassium, sodium, calcium, magnesium, and aluminum have a negative effect on the adsorption capacity. More than 99% europium adsorbed on H-APC eluted with 0.5 M HCl solution. The activated carbon prepared from apricot stone using 70% H3PO4 could be considered as an adsorbent that has a commercial potential for Eu(III) treatment.

Keywords: Activated Carbon, Apricot Stone, Eu(III), Sorption/Desorption, Diverse Ions, Desorbing Agents, Aqueous-Solution, Adsorption, Ions, Removal, Water, Sorption, Surface, Equilibrium, Adsorbents, Sawdust

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Full Text: [2008\Sep Sci Tec43, 71.pdf](2008/Sep%20Sci%20Tec43,%2071.pdf)

Abstract: Separation characteristics of two systems of binary mixtures, namely, (i) copper and calcium, (II) copper and beta naphthol were studied using micellar-enhanced ultrafiltration (MEUF). Sodium dodecyl sulfate (SDS) was taken as the anionic surfactant. An organic polyamide membrane of molecular weight cut-off 5 kDa was used in cross flow MEUF experiments. Suitable feed surfactant concentration was found to be about 25 kg/m3. The effects of the feed composition, the transmembrane pressure drop, and the cross flow rate on the permeate flux and observed retention of each solute were studied. For single solute systems, the observed retention of both copper and calcium were about 99% for a solute concentration up to 1.0 kg/m3 but the retention reduced to 90% to 92% when solute concentration was increased to about 3 to 4 kg/m3. Retention of copper and calcium was in the range of 88 to 97% for various compositions in their binary mixture. Retention of beta naphthol was in between 82 to 84% in its mixture with copper, whereas, about 92% separation of beta naphthol was achieved in the single solute system. Binding isotherms of both calcium and copper and beta naphthol and copper were evaluated in their binary mixture using extended Langmuir isotherm. A two-step chemical treatment was adopted to recover the surfactant.

Keywords: Metal Ions, Aromatic Alcohol, Anionic Surfactant, Micellar-Enhanced, Ultrafiltration, Permeate Flux, Observed Retention, Precipitation, Aqueous Streams, Waste-Water, Simultaneous Removal, Dissolved Organics, Heavy-Metal, Phenol, Adsorption, Effluents, Nickel, Copper

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Full Text: [2008\Sep Sci Tec43, 192.pdf](2008/Sep%20Sci%20Tec43,%20192.pdf)

Abstract: In this study, the biosorption of Basic Blue 9 (BB9) dye from aqueous solutions onto a biomass of Euphorbia rigida was examined by means of the initial biosorbate concentration, biosorbent amount, particle size, and pH. Biosorption of BB9 onto E. rigida increases with both the initial biosorbate concentration and biosorbent amount, whereas decreases with the increasing particle size. The experimental data indicated that the biosorption isotherms are well-described by the Langmuir equilibrium isotherm equation at 20, 30, and 40°C. Maximum biosorption capacity was 3.28×10-4 mol g-1 at 40°C. The biosorption kinetics of BB9 obeys the pseudo-second-order kinetic model. The thermodynamic parameters such as ΔG°, ΔH° and ΔS° were calculated to estimate the nature of biosorption. These experimental results have indicated that E. rigida has the potential to act as a biosorbent for the removal of Basic Blue 9 from aqueous solutions.

Keywords: Adsorbents, Aqueous Solutions, Bagasse-Fly-Ash, Basic Dye, Biomass, Biosorbent, Biosorption, Biosorption Kinetics, Bottom Ash, De-Oiled-Soya, Dye, Equilibrium, Equilibrium Isotherm, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Methylene-Blue Adsorption, Peanut Hull, pH, Removal, Size, Thermodynamic Parameters, Waste-Water

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Full Text: [2008\Sep Sci Tec43, 389.pdf](2008/Sep%20Sci%20Tec43,%20389.pdf)

Abstract: An aminated hypercrosslinked polymeric resin AH-1, a macroporous polymeric resin NG-8 and its aminated derivative NG-9 were used for the adsorption of tannic acid from aqueous solution. The batch system was applied to study the adsorption equilibrium on the three polymeric adsorbents. Equilibrium adsorption data were obtained and fitted very well to Langmuir model. The results showed that the pore size distribution and the tertiary amino group on the polymer played a significant role in tannic acid adsorption performance, and polymer NG-9 showed the highest adsorption capacity due to the suitable pore size distribution and the presence of the tertiary amino group. In addition, a thermodynamic study was carried out to interpret the adsorption mechanism. The kinetic study testified that the tertiary amino group on the polymer matrix could decrease the adsorption rate and the large average pore size of the resin was in favor of the adsorption rate increase.

Keywords: Macroporous Polymer, Tannic Acid, Adsorption, Thermodynamics, Kinetics, Phenolic-Compounds, Adsorbent, Single

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Full Text: [2008\Sep Sci Tec43, 403.pdf](2008/Sep%20Sci%20Tec43,%20403.pdf)

Abstract: Copolymerization of glycidyl methacrylate (GMA) in the presence of divinylbenzene (DVB) or N,N’-methylene bis-acrylamide (MBA) as hydrophobic or hydrophilic crosslinker was carried out. The obtained resins were immobilized with tetraethylenepentamine as active moieties. The (MBA) containing resin showed higher uptake capacity (9.0 mmol/g) towards Fe(III) compared to (DVB) containing one (8.1 mmol/g). Moreover, magnetization of (GMA/MBA) resin by embedded Fe3O4 dramatically improved its uptake towards Fe(III) to reach 13.0 mmol/g at 28°C-. Kinetic studies indicated that the adsorption of Fe(III) by the investigated resins follows the pseudo second order kinetics. The higher efficiency of the magnetic resin towards uptake of Fe(III) was also confirmed through column studies. Regeneration of the resins was achieved using acidified thiourea with HNO3. The durability of the resins was checked up to 5 cycles with no appreciable change in uptake capacity or durability.

Keywords: Adsorption, Aqueous-Solutions, Chelating Resin, Copolymer, Copper(II), Glycidyl Methacrylate, Heavy-Metals, Hg(II), Immobilized, Ion-Exchange Properties, Iron, Iron, Kinetics, Particles, Removal, Resins, Thermodynamics

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Full Text: [2008\Sep Sci Tec43, 582.pdf](2008/Sep%20Sci%20Tec43,%20582.pdf)

Abstract: Exhausted ground coffee waste has been investigated as metal biosorbent for Cr(VI) from aqueous solution. Maximum metal sorption was found to occur at initial pH 3.0. Kinetic studies revealed that the initial uptake was quite rapid, nevertheless, it took five days to reach equilibrium. The value of the Langmuir maximum uptake was found to be 10.2 mg Cr(VI)/g waste. The sorbent is able to reduce hexavalent chromium to its trivalent form. A solution of I M NaOH was the most effective desorption agent and after 24 hours contact 42% of total chromium was desorbed in both hexavalent and trivalent oxidation states.

Keywords: Metal Removal, Chromium, Low Cost Sorbent, Sorption, Aqueous-Solutions, Hexavalent Chromium, Removal, Adsorption, Ions, Adsorbent, Metals

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Full Text: [2008\Sep Sci Tec43, 597.pdf](2008/Sep%20Sci%20Tec43,%20597.pdf)

Abstract: The Zr(IV) and Hf(IV) biosorption characteristics of rice bran, wheat bran and Platanus orientalis tree leaves were examined as a function of initial pH, contact time, temperature, and initial metal ions concentration. Adsorption equilibriums were achieved in about 1, 5 and 40 min for rice bran, wheat bran, and leaves respectively. The biosorption behavior of leaves was significantly affected by solution pH whereas rice bran and wheat bran adsorption efficiencies were slightly affected by solution pH. The Freundlich and Langmuir adsorption equations, which are commonly used to describe sorption equilibrium for metals removal by biomasses, were use to represent the experimental and equilibrium data fitted well to the Langmuir isotherm model. The negative Gibbs free energy values obtained in this study with rice bran wheat bran and Platanus orientalis tree leaves confirmed the feasibility of the process and the spontaneous nature of sorption. In the optimum conditions, the adsorption efficiencies of other metal ions such as Fe3+, Cu2+, Pb2+, Hg2+, La3+, Ce3+ were significantly lower than Zr(IV) and Hf(IV) ions and these biomasses are excellent sorbents for the selective uptake of proposed ions from acidic aqueous solutions.

Keywords: Biosorption, Zirconium, Hafnium, Rice Bran, Wheat Bran, Platanus Orientalis Tree Leaves, Surfactant-Modified Montmorillonite, Heavy-Metals, Adsorption, Ions, Equilibrium, Sorption, Removal, Isotherm, Cadmium, Algae

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Full Text: [2008\Sep Sci Tec43, 886.pdf](2008/Sep%20Sci%20Tec43,%20886.pdf)

Abstract: Adsorption study with untreated and zinc chloride (ZnCl2) treated coconut granular activated carbon (GAC) for nitrate removal from water has been carried out. Untreated coconut GAC was treated with ZnCl2 and carbonized. The optimal conditions were selected by studying the influence of process variables such as chemical ratio and activation temperature. Experimental results reveal that chemical weight ratio of 200% and temperature of 500°C was found to be optimum for the maximum removal of nitrate from water. Both untreated and ZnCl2 treated coconut GACs were characterized by scanning electron microscopy (SEM), Brunauer Emmett Teller (BET) N2-gas adsorption, surface area and Energy Dispersive X-Ray (EDX) analysis. The comparison between untreated and ZnCl2 treated GAC indicates that treatment with ZnCl2 has significantly improved the adsorption efficacy of untreated GAC. The adsorption capacity of untreated and ZnCl2 treated coconut GACs were found 1.7 and 10.2 mg/g, respectively. The adsorption of nitrate on ZnCl2 treated coconut GAC was studied as a function of contact time, initial concentration of nitrate anion, temperature, and pH by batch mode adsorption experiments. The kinetic study reveals that equilibrium was achieved within one hour. The adsorption data conform best fit to the Langmuir isotherm. Kinetic study results reveal that present adsorption system followed a pseudo-second-order kinetics with pore-diffusion-controlled. Results of the present study recommend that the adsorption process using ZnCl2 treated coconut GAC might be a promising innovative technology in future for nitrates removal from drinking water.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Isotherms, Analysis, Aqueous-Solutions, Bed Reactor, Bet, Capacity, Carbon, Chloride, Comparison, Denitrification, Drinking Water, Drinking-Water, EDX, Efficacy, Electron Microscopy, Equilibrium, Experiments, Function, Granular Activated Carbon, Isotherm, Kinetic, Kinetic Modeling, Kinetic Study, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbent, Nitrate Removal, pH, Pseudo-Second-Order Kinetics, Reduction, Removal, Scanning Electron Microscopy, SEM, Sorption, Surface Area, Technology, Temperature, Treatment, Waste-Water, Water, Water Treatment, Zero-Valent Iron, Zinc, ZnCl2 Treated Activated Carbon

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Full Text: [2008\Sep Sci Tec43, 886.pdf](2008/Sep%20Sci%20Tec43,%20886.pdf)

Abstract: Zeolites have been shown to be effective adsorbents for the removal of heavy metals from aqueous solutions. In this study, mordenite (a natural zeolite) has been used for the removal of lead ions to evaluate its potential use as a low-cost adsorbent. Batch experiments have been conducted to evaluate the equilibrium and process kinetics at different temperatures. The equilibrium experimental data for various temperatures studied conformed to the six adsorption isotherm equations: the Langnmir, Freundlich, Sips, Redlich-Peterson (RP), Dubinin-Radwhkevich (DR), and Flory-Huggins (FH). Constants were determined for each of the isotherms. The apparent thermodynamic parameters were calculated and the obtained values supported the conclusion that the lead ions adsorption onto mordenite was a spontaneous, exothermic process of physical nature. The kinetic experimental data fitted the pseudo-second-order, parabolic diffusion and Elovich equations successfully. The process of lead ions adsorption onto the Na-mordenite was diffusion-controlled. The value of apparent activation energy also confirmed a physical mechanism for the adsorption of lead ions onto Na-mordenite.

Keywords: Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherm, Aqueous Solutions, Clinoptilolite, Copper, Diffusion, Equilibrium, Exchange, Experimental, Experiments, Freundlich, Heavy Metals, Isotherm, Isotherm Equations, Isotherms, Kinetic, Kinetic Modeling, Kinetics, Lead, Lead(II), Mechanism, Metals, Modeling, Mordenite, Na-Mordenite, Pb(II), Potential, Removal, Silica, Sorption, Temperature, Thermodynamic Parameters, Thermodynamics, Zeolite, Zeolites

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Full Text: [2008\Sep Sci Tec43, 960.pdf](2008/Sep%20Sci%20Tec43,%20960.pdf)

Abstract: The capability of Iranian natural clinoptilolite for ammonia removal from aqueous solutions has been thoroughly studied. Both batch and continuous (column) experiments were carried out. The viability of this natural zeolite in reducing the leakage of ammonia to the environment through waste water streams was a main focus of this research. Through the batch experiments, the effect of process variables such as the size of zeolite particles, pH, and ammonia concentration of the feed solution on the kinetics of ammonia uptake were investigated. Ammonia removal occurred rapidly and within the first 15 minutes of contact time, a major part of ammonia was removed from the solution. An adsorption capacity about 17.8 mg NH4+/g zeolite at feed ammonia concentration of 50 mg/L was obtained and the optimum range for pH was achieved about 5.5-7.6. The adsorption capacity of clinoptilolite in the continuous mode was about 15.16 and 15.36 mg NH4+/g zeolite for the original and regenerated types of clinoptilolite, respectively, where feed ammonium concentration was 50 mg/L. Increasing the feed ammonium concentration to 100 mg/L did not reduce the capability of the column for its ammonium removal and up to a bed volume (BV) of 85, there was only less than 1 mg/L ammonium in the column outlet. Presence of cations such as Ca2+, Mg2+ and Na+ in the feed solution reduced the clinoptilolite adsorption capacity to about 11.68 mg NH4+/g zeolite. Regeneration experiments were carried out using concentrated sodium chloride solutions, as well as tap water. Where tap water was used as the regenerant, gradual release of ammonium from exhausted clinoptilolite was observed.

Keywords: Ammonia, Clinoptilolite, Ion Exchange, Natural Zeolite, Wastewater, Fertilizer, Ion-Exchange, Waste-Water, Clinoptilolite, Mordenite

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Full Text: [2008\Sep Sci Tec43, 1221.pdf](2008/Sep%20Sci%20Tec43,%201221.pdf)

Abstract: Mercury removal from wastewater is a recognized pollution control challenge today. In the present investigation, the biosorption of Hg(II) onto the dead biomass of four different species of marine Aspergillus, prepared by alkaline treatment, was studied. Among the cultures studied, A. niger was found to be the most efficient for Hg(II) removal. The effects of initial Hg(II) concentration, contact time, pH, temperature, and biosorbent dosage on biosorption were also investigated. It was observed that biosorption equilibriums were established in about 2h. Under the optimum conditions (pH: 3.0, Hg(II) concentration: 250mg/L, biomass dose: 0.8 g/L, temperature: 40°C and contact time: 2h), 40.53 mg Hg(II) was biosorbed per gram of dead biomass of A. niger. Kinetic studies based on fractional power, zero order, first order, pseudo first order, Elovich, second order, and second order rate expressions have also been carried out where the pseudo second order model exhibited best fit to experimental data. The intra-particle diffusion study revealed that film diffusion is the rate-limiting sorption process for Hg(II) on A. niger. The nature of the possible cell-metal ion interactions was evaluated by FTIR, SEM, and EDAX analysis. These examinations indicated the involvement of -OH and -NH2+ groups in the biosorption process present on the surface of the dead fungal biomass. Here, Hg(II) ions were deposited on the surface of the biomass as a film like structure.

Keywords: Activated Carbon, Analysis, Aqueous Solution, Aspergillus Niger, Biomass, Biosorbent, Biosorption, Biosorption, Bone Char, Cadmium Ions, Diffusion, Experimental, First, FTIR, Fungal Biomass, Hg(II), Inorganic Mercury, Intra-Particle Diffusion, Investigation, Kinetic, Kinetics, Lead, Marine Fungi, Mercury, Mercury Removal, Methyl Mercury, Model, pH, Pollution, Removal, SEM, Solution, Sorption, Sorption Process, Structure, Temperature, Treatment, Tree Fern, Waste, Wastewater

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Full Text: [2008\Sep Sci Tec43, 1239.pdf](2008/Sep%20Sci%20Tec43,%201239.pdf)

Abstract: The present study aims to evaluate the influence of various experimental parameters viz. initial pH (pH(0)), adsorbent dose, contact time, initial concentration and temperature on the adsorptive removal of furfural from aqueous solution by commercial grade activated carbon (ACC). Optimum conditions for furfural removal were found to be pH(0) approximate to 5.9, adsorbent dose approximate to 10g/1 of solution and equilibrium time approximate to 6.0h. The adsorption followed pseudo-second-order kinetics. The effective diffusion coefficient of furfural was of the order of 10-13 m2/s. Furfural adsorption onto ACC was found to be best represented by the Redlich-Peterson isotherm. A decrease in the temperature of the operation favorably influenced the adsorption of furfural onto ACC. The positive values of the change in entropy (Delta S-0), and the negatived value of heat of adsorption (Delta H-0) and change in Gibbs free energy (Delta G(0)) indicated feasible, exothermic, and spontaneous nature of furfural adsorption onto ACC.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Aqueous Solution, Bagasse Fly-Ash, Carbon, Diffusion, Dioxide, Dye, Entropy, Equilibrium, Experimental, Furfural, Furfurals, Heat of Adsorption, Isotherm, Isotherms, Kinetic, Kinetics, pH, Pseudo-Second-Order Kinetics, Removal, Solution, Temperature

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Full Text: [2008\Sep Sci Tec43, 1365.pdf](2008/Sep%20Sci%20Tec43,%201365.pdf)

Abstract: A composite chitosan biosorbent (CCB) was prepared by coating chitosan on to ceramic alumina. The adsorption characteristics of the sorbent for copper and nickel ions were studied under batch equilibrium and dynamic flow conditions at pH 4.0. The equilibrium adsorption data were correlated with Langmuir, Freundlich, and Redlich-Peterson models. The ultimate monolayer capacities, obtained from Langmuir isotherm, were 86.2 and 78.1mg/g of chitosan for Cu(II) and Ni(II), respectively. In addition, dynamic column adsorption studies were conducted to obtain breakthrough curves. After the column was saturated with metal ions, it was regenerated with 0.1M sodium hydroxide. The regenerated column was used for a second adsorption cycle.

Keywords: Adsorption, Chitosan, Copper(II), Nickel(II), Adsorption Isotherms, Metal-Ions, Adsorption Properties, Equilibrium, Resin, Complexation, Kinetics, Sorption, Flakes, Peat

? Nandi, B.K., Goswami, A., Das, A.K., Mondal, B. and Purkait, M.K. (2008), Kinetic and equilibrium studies on the adsorption of crystal violet dye using kaolin as an adsorbent. *Separation Science and Technology*, **43** (6), 1382-1403.

Full Text: [2008\Sep Sci Tec43, 1382.pdf](2008/Sep%20Sci%20Tec43,%201382.pdf)

Abstract: Experimental investigations are carried out to adsorb toxic crystal violet dye from aqueous medium using kaolin as an adsorbent. Characterization of kaolin is done by measuring i. particle size distribution using particle size analyzer, ii. BET surface area using BET surface analyzer, iii. structural analysis using X ray diffractometer, and iv. microscopic analysis using scanning electron microscope. The effects of initial dye concentration, contact time, kaolin dose, stirring speed, pH, and temperature are studied for the adsorption of crystal violet in batch mode. Adsorption experiments indicate that the extent of adsorption is strongly dependent on the pH of the solution. Free energy of adsorption (ΔG°), enthalpy (ΔH°), and entropy (ΔS°) changes are calculated to know the nature of adsorption. The calculated values of ΔG° are -4.11 and -4.48 kJ/mol at 295K and 323 K, respectively, for 20 mg/L of dye concentration, which indicates that the adsorption process is spontaneous. The estimated values of Ho and So show the negative and positive sign, respectively, which indicate that the adsorption process is exothermic and the dye molecules are organized on the kaolin surface in more random fashion than in solution. The adsorption kinetic has been described by pseudo first order, pseudo second order and intra-particle diffusion models. It is observed that the rate of dye adsorption follows pseudo second order model for the dye concentration range studied in the present case. Standard adsorption isotherms are used to fit the experimental equilibrium data. It is found that the adsorption of crystal violet on kaolin follows the Langmuir adsorption isotherm.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetic, Adsorption Process, Analysis, Aqueous Medium, Aqueous-Solutions, Batch, Batch Mode, BET, BET Surface Area, Changes, Characterization, Concentration, Contact, Crystal Violet, Data, Decolorization, Diffusion, Distribution, Dye, Dye Adsorption, Effects, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Studies, Exothermic, Experimental, Experiments, First, First Order, Fly-Ash, Intra-Particle Diffusion, Intraparticle, Intraparticle Diffusion, Investigations, Isotherm, Isotherms, Kaolin, Kinetic, Langmuir, Langmuir Adsorption Isotherm, Methyl-Violet, Micellar-Enhanced Ultrafiltration, Mode, Model, Models, Particle Size, Particle Size Distribution, pH, Process, Pseudo, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Second Order, Second-Order, Sem, Size, Size Distribution, Solution, Spontaneous, Structural Analysis, Surface, Surface Area, Temperature, Toxic, Values, Waste-Water, X-Ray, Zero Point Charge

? Biswas, B.K., Inoue, K., Ghimire, K.N., Kawakita, H., Ohto, K. and Harada, H. (2008), Effective removal of arsenic with lanthanum(III)- and cerium(III)-loaded orange waste gels. *Separation Science and Technology*, **43** (8), 2144-2165.

Full Text: [2008\Sep Sci Tec43, 2144.pdf](2008/Sep%20Sci%20Tec43,%202144.pdf)

Abstract: Orange waste has been chemically modified and loaded with lanthanum(III) and/or cerium(III) to examine its adsorption behavior to both As(V) and As(III). Arsenate removal was found to be favored over a pH range of 6 similar to 9.5 while arsenite removal took place at pH values ranging from 9 to 11. The maximum sorption capacity of the gel for As(III) removal was evaluated as 43 mg/g, while that for As(V) was 42 mg/g. Column-mode tests using the La(III)-loaded gel confirmed a complete removal of As(V). A reasonably high adsorption potential within the design criteria makes the present gel an alternative choice for arsenic removal.

Keywords: Adsorption, Arsenic, Ligand Substitution, Orange Waste Gel, Ligand-Exchange Sorption, Ferric Ion Form, Chelating Resin, Aqueous-Solutions, Adsorption, Biosorption, Anions, Water, Adsorbents, Cadmium

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Full Text: [2008\Sep Sci Tec43, 2208.pdf](2008/Sep%20Sci%20Tec43,%202208.pdf)

Abstract: The potential use of blank alginate beads and immobilized dead algal cells for the removal of naphthalene from aqueous solutions was investigated in this study. The effects of contact time, solution pH, and naphthalene concentration on the sorption of naphthalene on blank alginate beads or immobilized dead algal cells were studied. The effect of the presence of other pollutants on the sorption of naphthalene on immobilized dead algal cells was also studied. Batch adsorption experiments showed that the removal of naphthalene on both sorbents was pH dependent and significant removal of naphthalene was obtained at pH 4. Dynamic sorption experiments revealed that the biosorption of naphthalene on either sorbent was rapid where the equilibrium uptake occurred within 10 minutes, and the biosorption of naphthalene on either sorbent followed the pseudo-second order kinetics. Analysis of the equilibrium sorption data showed that naphthalene sorption on either sorbent could be fitted to the Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) isotherm equations. Competitive biosorption experiments showed that biosorption of naphthalene on immobilized dead algal cells was adversely affected by the presence of either heavy metals such as copper and nickel, and chelating agents such as citric acid.

Keywords: Activated-Sludge, Adsorption, Alginate, Aqueous Solutions, Aqueous-Solutions, Beads, Binary, Biosorption, Citric Acid, Copper, Degradation, Equilibrium, Experiments, Freundlich, Heavy Metals, Immobilized, Immobilized Dead Algal Cells, Isotherm, Isotherm Equations, Isotherms, Kinetics, Langmuir, Metals, Model, Naphthalene, Nickel, pH, Ph-Dependent, Phenol, Pollutants, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Single, Solution, Sorbent, Sorbents, Sorption, Waste Water, Wastewater

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Full Text: [2008\Sep Sci Tec43, 2406.pdf](2008/Sep%20Sci%20Tec43,%202406.pdf)

Abstract: A composite polymer (made of gelatin and alginate) was used for the synthesis of Cyphos IL 101-immobilized resins. These resins (with varying size and different ionic liquid (IL) content) have been tested for the recovery of mercury from concentrated HCl solutions (0.1-5M HCl concentrations). Prior to the study of sorption performance on resins, the reactivity of Cyphos IL 101 versus mercury was tested using solvent extraction methodology. These results showed that the extraction was hardly affected by the concentration of HCl and that an ion exchange mechanism was probably involved in metal recovery (binding of HgCl42-). The performance of these resins for Hg(II) recovery was tested through sorption isotherms and uptake kinetics, investigating the effect of resin size, ionic liquid content, metal concentration, agitation speed, and resin state (dry state versus wet state). Sorption capacity (which was proportional to the IL content) can reached up to 150mg Hg g-1 in 1M HCl, this sorption capacity was decreased by increasing chloride concentration. The kinetics were described well by the pseudo-second order equation and by the intraparticle diffusion equation (the so-called Crank’s equation). The intraparticle diffusion coefficient was in the range of 10-11-1.2×10-10 m2min-1. The kinetic profiles were controlled by the IL content, sorbent dosage, and the sorbent particle size. Drying of the resins significantly decreased diffusion rates in the resins. The presence of competitor metals did not affect sorption capacity except when stable chloro-anionic species such as in the case of Zn(II) were formed. Mercury can be desorbed using 6M nitric acid solutions, and the sorbent can be recycled for at least six sorption/desorption cycles without significant decrease in the sorption performance.

Keywords: Affect, Agitation, Alginate, Alginate Microcapsules, Aqueous-Solutions, Aryl Halides, Binding, Biopolymer, Capacity, Capsules, Chitosan, Chloride, Composite, Concentration, Cycles, Cyphos IL 101, Desorption, Diffusion, Diffusion Coefficient, Enclosing Cyanex-302 Extractant, Exchange, Extraction, Gelatin, Hg(II), Immobilization, Immobilized, Intraparticle, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ionic Liquid, Isotherms, Kinetic, Kinetics, Lactic-Acid, Liquid, Mechanism, Mercury, Metal, Metals, Methodology, Nanofiltration, Palladium, Particle Size, Performance, Phosphonium Ionic Liquids, Polymer, Profiles, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Equation, Pseudo-Second-Order, Rates, Recovery, Resin, Resins, Size, Solutions, Sorbent, Sorbent Dosage, Sorption, Sorption Capacity, Sorption Isotherm, Sorption Isotherms, Sorption, Desorption, Species, State, Synthesis, Ultrafiltration, Uptake, Uptake Kinetics, Zn(II)

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Full Text: [2008\Sep Sci Tec43, 3168.pdf](2008/Sep%20Sci%20Tec43,%203168.pdf)

Abstract: Two samples of chemically modified seaweed Ascophyllum nodosum (NS-1 and DS-1) were used for selective removal of metal (W, Mo, V, Ge, and Sb) oxoanions. All experiments were carried out by dynamic column sorption. The effects of pH, the concentration of the accompanying anions in the feed solution, and the effect of the flow rate were studied. Tungstate, molybdate, and vanadate were adsorbed extensively. Sorption of Sb(III) anion was notable but the sorption capacity was very low and the desorption was difficult. Sorption of Ge(IV) oxoanion was negligible. Stability of the NS-1 and DS-1 sorbents was limited by, 20 and 25 sorption cycles, respectively.

Keywords: Biosorption, Metal Oxoanions, Seaweed, Liquid-Liquid-Extraction, Special Chelating Resin, Arsenic Removal, Aqueous-Solutions, Drinking-Water, Ion-Exchange, Waste-Water, Fungal Biomass, Heavy-Metals, Biosorption

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Full Text: [2008\Sep Sci Tec43, 3251.pdf](2008/Sep%20Sci%20Tec43,%203251.pdf)

Abstract: In this study, the effectiveness of dried activated sludge in removing phenol from aqueous solutions was examined by biosorption as a function of temperature, pH, and initial phenol concentration. Batch kinetic studies showed that an equilibrium time of 60 min was needed for the biosorption. The maximum phenol biosorption capacity was obtained as 42.7 mg g-1 at the temperature of 40°C at pH = 8.0. The Freundlich and Langmuir adsorption models were used for the mathematical description of the biosorption equilibrium and it was reported that experimental data fitted very well to the Freundlich model. Adsorption rate data were analyzed using the pseudo-first order kinetic model of Lagergren and the pseudo-second order model to determine adsorption rate constants at 10, 25, and 40°C. It was reported that, the pseudo-second order kinetic model provided the best correlation of the experimental data rather than the pseudo-first order model. The thermodynamic parameters such as, Gibbs free energy changes (ΔG°), enthalpy change (ΔH°) and entropy change (ΔS°) were determined. The results show that biosorption of phenol on dried activated sludge is an endothermic and spontaneous in nature.

Keywords: Adsorption, Aqueous-Solutions, Biomass, Biosorption, Carbon, Dried Activated Sludge, Equilibrium, Equilibrium, Kinetic, Phenol, Pseudo-Second Order, Removal, Sorption, Thermodynamic, Water

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Full Text: [2008\Sep Sci Tec43, 3221.pdf](2008/Sep%20Sci%20Tec43,%203221.pdf)

Abstract: Kaolinite and montmorillonite were treated with 0.25 M H2SO4 and the acid activated clays along with the parent clays were tested for their uptake capacity for Ni(II) ions from aqueous solution. The batch adsorption experiments were conducted under a set of variables (concentration of Ni(II) ion, amount of clay, pH, time and temperature of interaction). Increasing pH favored Ni(II) uptake till the ions were precipitated as the insoluble hydroxides at pH 8.0. The uptake was rapid up to 40 min and equilibrium was obtained within 180 min. The kinetics of the process was evaluated by subjecting the results to a number of models like the pseudo-first order, second order, Elovich equation, liquid film diffusion, and intra-particle diffusion and it was found that the data more closely resembled a second order process. The experimental data conformed to both Langmuir and Freundlich isotherms showing that the interactions were mostly chemical in nature. The clays had reasonable monolayer adsorption capacity of 10.4, 11.9, 28.4, and 29.5 mg g-1 for kaolinite, acid activated kaolinite, montmorillonite, and acid-activated montmorillonite respectively. Montmorillonite had much better adsorption capacity than kaolinite and the acid activation boosted the adsorption capacity of both kaolinite and montmorillonite. The interactions were exothermic in nature, accompanied by decrease in both entropy and Gibbs energy. The results have established good potentiality for kaolinite, montmorillonite and their acid-activated forms to take up and separate Ni(II) from aqueous medium through adsorption-mediated immobilization.

Keywords: Acid-Activation, Adsorption, Adsorption, Batch, Catalytic-Activity, Copper, Equilibrium, Fly-Ash, Heavy-Metal, Industry Waste, Intraparticle, Kaolinite, Kinetics, Montmorillonite, Red Mud, Removal, Water

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Full Text: [2008\Sep Sci Tec43, 3522.pdf](2008/Sep%20Sci%20Tec43,%203522.pdf)

Abstract: A novel adsorbent, formaldehyde polymerized tamarind fruit shell (FPTFS) containing sulphonic acid functional groups was prepared and its utility for Hg(II) adsorption from water and wastewater was investigated. The kinetic and isotherm data, obtained at optimum pH value 6.0 for different concentrations and temperatures, could be fitted with the Ritchie modified second-order equation and Sips isotherm model respectively and the coefficients indicated favorable adsorption of Hg(II) on the FPTFS. The complete removal of 23.86 mg/L Hg(II) from chlor-alkali industry wastewater was achieved by 4 g/L FPTFS. The reusability of the FPTFS for several cycles was also demonstrated using 0.1M HCl solution.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Biomass, Cadmium, Copper Ions, Data, Desorption, Elovich Equation, Formaldehyde, Functional Groups, Heavy-Metal, Hg(II), Isotherm, Isotherm Model, Kinetic, Kinetics, Mercury(II) Adsorption, Model, Modified, Modified Second Order Equation, Pb(II), pH, pH Value, Removal, Sawdust, Second Order, Second-Order, Second-Order Equation, Solution, Sorption, Tamarind Fruit Shell, Thermodynamic Parameters, Utility, Value, Wastewater, Water

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Full Text: [2008\Sep Sci Tec43, 3545.pdf](2008/Sep%20Sci%20Tec43,%203545.pdf)

Abstract: A batch study showed that the presence of anions (sulfate, chloride, and nitrate) in solution did not affect the adsorption process of both As(V) and As(III) by iron oxide-coated A. niger biomass. It was found that the presence of Ca2+, Fe2+, and Mg2+ ions at a concentration of 200 mg/L in solution could increase the removal efficiency of As(V) by 86.5%, 95.4%, and 65.8%, respectively. Similarly, the presence of Ca2+, Fe2+, and Mg2+ ions at a concentration of 200 mg/L in solution could increase the removal efficiency of As(III) by 39.3%, 97%, and 8.4%, respectively. The batch adsorption-desorption study showed that the reactions between the arsenic species and the iron oxide-coated A. niger biomass were reversible. Desorption of As(V) and As(III) at neutral pH was approximately 15%. As(V) desorbed more than As(III) in acidic (pH 1.33) and alkaline (pH 12.56) solutions. At a pH of 1.33, 67% of the adsorbed As(V) desorbed, and the percentage of desorbed As(III) was only 47.1% in the same condition. At a solution pH of 12.56, 73.4% of the As(V), and 43.7% of As(III) desorbed. The thermodynamic study showed the spontaneous nature of the sorption of arsenic on IOCB. The high value of the heat of adsorption {ΔH approximate to-133 kJ/mol for As(V), and 88.9 k/mol for As(III)} indicated that the mechanism of arsenic sorption was chemisorption.

Keywords: Adsorption, Purification, Biosorption, Batch Processing, Thermodynamics, Ion Effect, Fungal Biomass, Adsorption, Groundwater, Adsorbent, Column, Waste, Water, Acid

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Full Text: [2008\Sep Sci Tec43, 3563.pdf](2008/Sep%20Sci%20Tec43,%203563.pdf)

Abstract: The adsorption of Cr(VI) from aqueous solution by Turkish vermiculite were investigated in terms of equilibrium, kinetics, and thermodynamics. Experimental parameters affecting the removal process such as pH of solution, adsorbent dosage, contact time, and temperature were studied. Equilibrium adsorption data were evaluated by Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models. Langmuir model fitted the equilibrium data better than the Freundlich model. The monolayer adsorption capacity of Turkish vermiculite for Cr(VI) was found to be 87.7mg/g at pH 1.5, 10 g/L adsorbent dosage and 20°C. The mean free energy of adsorption (5.9 kJ/mol) obtained from the D-R isotherm indicated that the type of sorption was essentially physical. The calculated thermodynamic parameters (ΔG°, ΔH° and ΔS°) showed that the removal of Cr(VI) ions from aqueous solution by the vermiculite was feasible, spontaneous and exothermic at 20-50°C. Equilibrium data were also tested using the adsorption kinetic models and the results showed that the adsorption processes of Cr(VI) onto Turkish vermiculite followed well pseudo-second order kinetics.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetic, Aqueous Solution, Biomass, Capacity, Chromium(VI) Biosorption, Cr(VI), Cu(II), D-R Isotherm, Data, Energy, Equilibrium, Exothermic, Freundlich, Freundlich Model, Hazelnut Shell, Heavy-Metals, Ion-Exchange-Resins, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Model, Models, Monolayer, Pb(II), pH, Physical, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Saccharomyces-Cerevisiae, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Turkish Vermiculite, Vermiculite

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Full Text: [2008\Sep Sci Tec43, 3676.pdf](2008/Sep%20Sci%20Tec43,%203676.pdf)

Abstract: In this study the applicability of Zirconium ion impregnated coconut fiber carbon (ZICFC) as an adsorbent for fluoride removal from water was investigated. The dependence of fluoride adsorption on the physicochemical properties includes pH, agitation time, adsorbent dosage, temperature, and the initial concentration of the adsorbate. Maximum defluoridation was obtained at an original pH value of 4.0 with a rapid 93% adsorption being achieved within 10min of contact with ZICFC. Adsorption data for fluoride onto ZICFC were better correlated to the Langmuir isotherm and pseudo-second order chemical reaction provided the best fit for the experimental data as obtained from kinetic studies. A combination of chemisorption and physisorption processes in hand with intraparticle diffusion, account for the high defluoridation ability of ZICFC, with the thermodynamic parameters indicating an endothermic phenomenon. The fluoride adsorption capacity of ZICFC when compared with those of other commonly used fluoride adsorbents highlights the substantial improvement in fluoride adsorption capacity of coconut fiber carbon on zirconium impregnation.

Keywords: Activated-Charcoal, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Agitation, Aqueous-Solutions, Capacity, Carbon, Chemical, Chemisorption, Chitosan, Coconut Fiber, Coconut Fiber Carbon, Concentration, Data, Defluoridation, Diffusion, Drinking-Water, Endothermic, Equilibrium, Experimental, Fluoride, Fluoride Removal, Impregnation, Improvement, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Langmuir Isotherm, Metal-Ions, pH, Ph Value, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reaction Kinetics, Removal, Temperature, Thermodynamic, Thermodynamic Parameters, Value, Water, X-Ray-Fluorescence

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Full Text: [2008\Sep Sci Tec43, 3712.pdf](2008/Sep%20Sci%20Tec43,%203712.pdf)

Abstract: The removal of basic dye crystal violet by low-cost biosorbents was investigated in this study using a batch experimental system. The adsorption of crystal violet onto various adsorbents was solution pH-dependent and the maximum removal occurred at basic pH 10.0. The kinetic experimental data were analyzed using pseudo-first-order and pseudo-second-order equations to examine the adsorption mechanism and the intraparticle diffusion model to identify the potential rate controlling step. These results suggested that the adsorption of crystal violet onto various adsorbents was best represented by the pseudo-second-order equation. The suitability of the Langmuir and Freundich adsorption isotherms to the equilibrium data was also investigated at various temperatures for all four sorbents and the adsorption isotherms exhibited Freundlich behavior. The Freundlich constant K-f was 1.55 for alligator weed, 2.33 for Laminaria japonica, 9.59 for rice bran and 5.38 (mg/g)/(mg/L)(1/n) for wheat bran, respectively at adsorbent concentration 5g/L, pH 10.0 and 20°C. The thermodynamic parameters (ΔH, ΔG, and ΔS) were calculated and the results showed that the adsorption process for various adsorbents was spontaneous, endothermic, with an increased randomness, respectively. The particle size and the reaction temperature exhibited an insignificant impact on the adsorption equilibrium of crystal violet. The adsorbents investigated could serve as low-cost adsorbents for removing the crystal violet from aqueous solution.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Adsorption Mechanism, Aqueous Solution, Basic Dye, Batch, Behavior, Biosorbents, Blue, Concentration, Crystal Violet, Data, Diffusion, Diffusion Model, Dye, Endothermic, Equilibrium, Experimental, Freundlich, Freundlich Constant, Heavy-Metal, Impact, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherms, Kinetic, Kinetics, Langmuir, Low Cost Adsorbents, Low-Cost Adsorbents, Low-Cost Biosorbents, Mechanism, Mechanisms, Model, Particle Size, pH, pH-Dependent, Pith, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Randomness, Removal, Rice, Rice Bran, Rice-Husk, Sawdust, Size, Solution, Sorbents, System, Temperature, Thermodynamic, Thermodynamic Parameters, Wastewater Treatment, Water, Weed, Wheat Bran

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Full Text: [2008\Sep Sci Tec43, 3902.pdf](2008/Sep%20Sci%20Tec43,%203902.pdf)

Abstract: Biosorption experiments were carried out in batch and column mode for the removal of As(V) from aqueous solution using native, autoclaved and PVP treated Aspergillus clavatus biomass. The influence of process parameters such as contact time, As(V) concentration, adsorbent dosage, and pH have been investigated for As(V) adsorption. Maximum As(V) removal was observed with PVP K25 modified biomass (PVPAB) (80.25%) when compared to native (57%) and autoclaved (71.63%) biomass. PVPAB biomass required less time to reach equilibrium (90 min) whereas autoclaved and native biomass required 105 and 125 min to attain saturation respectively. The PVPAB showed maximum As(V) removal (Q(0) = 2.06 mg/g) and was used as adsorbent for column studies. Equilibrium isotherms were analyzed by Langmuir and Dubinin and Radushkevich isotherms. Kinetics of the adsorption process was studied using pseudo-first-order and second-order models and it was found to obey pseudo-second-order kinetic model. Desorption studies showed that PVPAB could be reused after regeneration and could lead to the development of viable and cost-effective technology for arsenic removal from ground water.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Aqueous Solution, Arsenic, Arsenic Removal, As(V), As(V) Adsorption, As(V) Removal, Aspergillus Clavatus, Batch, Biomass, Biosorbent, Biosorption, Biosorption, Carbon, Column, Column Modes, Column Studies, Concentration, Cost-Effective, Desorption, Development, Equilibrium, Equilibrium Isotherms, Experiments, Ground Water, High-Capacity, Ions, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead, Mode, Model, Models, Modified, PEI, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, PVP K25, Regeneration, Removal, Saturation, Second Order, Second-Order, Solution, Sorption, Technology, Waste, Water

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Full Text: [2009\Sep Sci Tec44, 40.pdf](2009/Sep%20Sci%20Tec44,%2040.pdf)

Abstract: The potential of coir, a low cost lignocellulosic material, was assessed for the removal of Cu(II) ion from aqueous solutions of copper sulphate. The coir fiber was also modified by an oxidative treatment, whereby the maximum uptake of Cu(II) increased to 6.99 mg/g as compared to 2.54 mg/g for the unmodified coir. A Langmuir type of adsorption was followed by oxidized coir fiber. A second order rate equation was observed for the Cu(II) uptake. The lowering of pH adversely affects adsorption on both the materials. Almost complete desorption of the loaded Cu(II) was possible using 0.25N hydrochloric acid. The materials retained the adsorptive capacity up to three cycles when an intermediate regeneration step was given with dilute sodium hydroxide solution. In a fixed column packed with oxidized coir fibers, it was observed that the breakthrough time decreased with an increase in inlet Cu(II) concentration. The desorption level in the fixed bed column was around 90% and the column was regenerated and used up to eight cycles. The fixed bed column packed with oxidized coir was used to remove Cu(II) from an electrochemical industrial effluent. An ion exchange mechanism has been proposed for uptake of Cu(II) on the oxidized coir fiber.

Keywords: Adsorption, Aqueous Solutions, Aqueous-Solutions, Au, Base, Bases, Biosorption, Breakthrough, Cadmium, Capacity, Coir, Column, Concentration, Copper, Cost, Cu(II), Cu(II) Ion, Cycles, Desalination, Desorption, Dyed Cellulosic Materials, Exchange, Fibers, Fixed Bed, Fixed-Bed Column, Hazard, Heavy-Metals, Industrial Effluent, Ion Exchange, Ion-Exchange, Langmuir, Lead, Low Cost, Mater, ME, Mechanism, Metal Ion, Metal-Ions, Modified, N, P, pH, Potential, Regeneration, Removal, SCI, Second Order, Second-Order, Sodium, Solution, Solutions, Sphagnum Moss, Technologies, Technology, Text, Textile, Treatment, Uptake, Water

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Full Text: [2009\Sep Sci Tec44, 75.pdf](2009/Sep%20Sci%20Tec44,%2075.pdf)

Abstract: Adsorption of two acid dyestuffs, acid blue 113 (AB) and tartrazine (TA), has been studied from their single and binary solutions by using fly ash (FA) as an adsorbent. The S shaped isotherms observed for dye adsorption from single solutions show that both acid dyes are not preferred at a low concentration region whereas adsorption of the dyes from binary solutions is enhanced via solute-solute interactions. Although the L-shaped isotherm is observed in binary solutions adsorbability of AB decreases in concentrated solutions with respect to single one, time dependency of adsorption is well described with a pseudo-second-order kinetic model as well as the linear relation of Bt vs. t plots (not passing through origin) indicates that film diffusion is effective on dye adsorption. Modeled isotherm curves using isotherm parameters of the Freundlich and Dubinin-Radushkevich (D-R) equations adequately fit to experimental equilibrium data. Equilibrium adsorption of AB in binary solutions has been quite well predicted by the extended Freundlich and the Sheindorf-Rebuhn-Sheintuch (SRS) models. In general, the isotherm curves constructed in the temperature range of 298-328K show that the optimum temperature is 318K for AB removal from both single and binary solutions.

Keywords: Acid Blue 113, Acid Dyes, Adsorbent, Adsorbents, Adsorption, Am, Aqueous-Solution, Ash, Brilliant Green-Dye, Carbon, Cd, Coal Ash, Concentration, Constructed, Data, Dependency, Desalination, Diffusion, Dye, Dye Adsorption, Dyes, Equilibrium, Equilibrium Isotherm Analyses, Experimental, Film, Film Diffusion, Fly Ash, Fly-Ash, Food, Freundlich, Ge, General, Hazard, INT, Interactions, Isotherm, Isotherm Parameters, Isotherms, Kinetic, Kinetic Model, Kinetics, Manage, Mater, Model, Models, N, Origin, P, Pigment, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, SCI, Solutions, Sorption, Surface, Surfactant, T, Tartrazine, Temperature, Waste-Water, Water

? Bhatnagar, A., Kumar, E., Minocha, A.K., Jeon, B.H., Song, H. and Seo, Y.C. (2009), Removal of anionic dyes from water using *Citrus limonum* (lemon) peel: Equilibrium studies and kinetic modeling. *Separation Science and Technology*, **44** (2), 316-334.

Full Text: [2009\Sep Sci Tec44, 316.pdf](2009/Sep%20Sci%20Tec44,%20316.pdf)

Abstract: The present study was undertaken to evaluate the adsorption potential of Citrus limonum (lemon) peel as an adsorbent for the removal of two anionic dyes, Methyl orange (MO) and Congo red (CR) from aqueous solutions. The adsorption was studied as a function of contact time, initial concentration, and temperature by batch method. The adsorption capacities of lemon peel adsorbent for dyes were found 50.3 and 34.5 mg/g for MO and CR, respectively. The equilibrium adsorption data was well described by the Langmuir model. Three simplified kinetic models viz. pseudo-first-order, pseudo-second-order, and Weber and Morris intraparticle diffusion model were tested to describe the adsorption process. Kinetic parameters, rate constants, equilibrium sorption capacities, and related correlation coefficients for each kinetic model were determined. It was found that the present system of dyes adsorption on lemon peel adsorbent could be described more favorably by the pseudo-first-order kinetic model. The results of the present study reveal that lemon peel adsorbent can be fruitfully utilized as an inexpensive adsorbent for dyes removal from effluents.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Process, Agricultural Solid-Waste, Anionic Dyes, Aqueous Solutions, Aqueous-Solutions, Batch, Batch Method, Coir Pith, Concentration, Congo Red, Contact, Correlation, Cr, Data, Diffusion, Diffusion Model, Dyes, Effluents, Equilibrium, Equilibrium Isotherms, Fly-Ash, Function, Intraparticle, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetic Model, Kinetic Modeling, Kinetic Models, Kinetic Parameters, Langmuir, Langmuir Model, Lemon Peel, Lemon Peel Waste, Low-Cost Adsorbent, Mo, Model, Modeling, Models, Natural Adsorbents, Potential, Process, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Removal, Solutions, Sorption, Temperature, Water

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Full Text: [2009\Sep Sci Tec44, 615.pdf](2009/Sep%20Sci%20Tec44,%20615.pdf)

Abstract: In the present study we reported for the first time, the feasibility of pecan nutshell (PNS-Carya illinoensis) as an alternative biosorbent to remove Cr(III), Fe(III) and Zn(II) metallic ions from aqueous solutions. The ability of PNS to remove these metallic ions was investigated by using batch biosorption procedure. The effects, such as pH and the biosorbent dosage on the adsorption capacities of PNS were studied. Five kinetic models were tested, the adsorption kinetics being the better fitted one to the fractionary-order kinetic model. The equilibrium data were fitted to Langmuir, Freundlich, Sips, and Redlich-Peterson isotherm models. Taking into account a statistical error function, the data were best fitted to Sips isotherm models. The maximum biosorption capacity of PNS were 93.01, 76.59, and 107.9mgg-1 for Cr(III), Fe(III), and Zn(II), respectively.

Keywords: Adsorption, Adsorption Capacities, Adsorption Kinetics, Alternative, Aqueous Solutions, Araucaria-Angustifolia Wastes, Atomic-Absorption-Spectrometry, Batch, Batch Conditions, Biosorbent, Biosorption, Biosorption, Capacity, Cr(III), Data, Equilibrium, Error, Fe(III), Feasibility, First, Freundlich, Fruit Shell, Function, Heavy Metals, Heavy-Metals, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Low-Cost Adsorbent, Low-Cost Adsorbents, Metals, Model, Models, Pecan Nutshell, Ph, Procedure, Redlich-Peterson, Solutions, Sorption Capacity, Statistical Design, Zn(II)

? Dimovic, S., Smiciklas, I., Plecas, I. and Antonovic, D. (2009), Kinetic study of Sr2+ sorption by bone char. *Separation Science and Technology*, **44** (3), 645-667.

Full Text: [2009\Sep Sci Tec44, 645.pdf](2009/Sep%20Sci%20Tec44,%20645.pdf)

Abstract: The effect of particle size, bone char mass, initial pH, and metal concentration on the kinetics of Sr2+ sorption by bone char was studied and discussed. Considering the sorbed amounts of Sr2+, solution pH changes, changes of Ca2+ concentrations and Ca/Sr molar ratios, with time, it was concluded that surface complexation reactions are dominant in the first, more rapid stage of the sorption process, while the contribution of the ion-exchange mechanism increases with time and becomes more significant in the second, slower phase. Under all investigated experimental conditions, the pseudo-second-order model was found to provide high correlation coefficients and the equilibrium amounts of Sr2+ sorbed comparable to the values obtained experimentally.

Keywords: Aqueous-Solutions, Bone, Bone Char, Cadmium Ions, Changes, Char, Complexation, Concentration, Contribution, Correlation, Equilibrium, Experimental, First, Hydrous Ferric-Oxide, Ion Exchange, Ion-Exchange, Ionexchange, Kinetic, Kinetic Models, Kinetics, Mass, Mechanism, Metal, Metal-Ions, Methylene-Blue, Model, Natural Clinoptilolite, Palm Kernel Fiber, Particle Size, pH, Process, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Size, Solution, Sorption, Sorption Kinetics, Sorption Kinetics, Sorption Process, Sr2+, Strontium, Surface, Surface Complexation, Values

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Full Text: [2009\Sep Sci Tec44, 681.pdf](2009/Sep%20Sci%20Tec44,%20681.pdf)

Abstract: A timber industry waste was transformed to activated carbon by a one-step chemical activation process using H3PO4 (H). The used activated carbon (SDH) was characterized by N2 adsorption, FTIR, density, pH, point of zero charge pHpzc, moisture and ash content. Methylene blue (MB) and the iodine number were calculated by adsorption from the solution. The applicability of the different activated carbon produced was carried out to treatment of aqueous waste contaminated with iodine-labeled prolactin (I-PRL) Treatment processes were performed under the varying conditions, contact time, temperature, carbon type, carbon dosage, and different particle size of the activated carbon (SDH). The results indicated that 5 hours are sufficient to reach a plateau, and the amount of I-PRL adsorbed on SDH activated carbons increase with the solution temperature with thermodynamic parameter of G=-7.962 (kJ/mol), H=28.869 (kJ/mol) and S=109.94 (J/mol K). The optimum adsorption results were reached using carbon dose of 0.1gm with particle size of0.25mm, and a batch factor (V/M) of 7.14mlg-1. First- and second-order equations, intraparticle diffusion equation, and the Elovich equation have been used to test experimental data. The experimental data was found to fit the second-order model and a chemisorptions mechanism. 0.7M NaOH can be used for regeneration of spent SDH activated carbon with the efficiency of 99.6% and the regenerated carbon can be reused for five cycles effectively.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorption, Agricultural By-Products, Aqueous-Solutions, Batch, Carbon, Charge, Chemical, Chemical Activation, Contact, Copper, Cycles, Data, Density, Diffusion, Efficiency, Elovich, Elovich Equation, Equilibrium, Experimental, FTIR, H3PO4, Intraparticle, Intraparticle Diffusion, Iodine, Iodine-Labeled Prolactin, Kinetics, Malachite Green, MB, Mechanism, Methylene Blue, Model, Moisture, N2, N2 Adsorption, NaOH, Particle Size, pH, pHPZC, Point of Zero Charge, Process, Prolactin, Regeneration, Removal, Sawdust, Sawdust, Second Order, Second-Order, Second-Order Model, Size, Solution, Solution Temperature, Temperature, Thermodynamic, Thermodynamic Parameter, Treatment, Waste

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Full Text: [2009\Sep Sci Tec44, 1452.pdf](2009/Sep%20Sci%20Tec44,%201452.pdf)

Abstract: The batch adsorption experiments were carried out using low-cost agricultural by-products, wheat bran and rice bran, for the removal of Congo red from aqueous solution at pH 8.0 and temperature of 25°C. Effects of important parameters such as contact time, adsorbent concentration, adsorbent modification and ion strength were investigated. The raw biomass and loaded Congo red biomass were characterized by FT-IR. The pseudo-first order equation and pseudo-second order equation were tested and the results showed that adsorption of Congo red followed the pseudo-second order very well. The Langmuir and Freundlich equations were applied to the data related to the adsorption isotherms and the observed maximum adsorption capacities (qm) were 22.73 and 14.63mg g-1 for wheat bran and rice bran, respectively. The effects of adsorbent concentration and ionic strength on the Congo red adsorption were marked. The adsorption performance has been significantly improved using rice bran modified by [image omitted].

Keywords: Activated Carbon, Adsorbent, Adsorption, Biosorption, Congo Red, Degradation, Dye Removal, Equilibrium, Heavy-Metal, Isotherm, Kinetics, Kinetics, Low-Cost Adsorbent, Methylene-Blue, Waste-Water

? Jain, S. and Jayaram, R.V. (2009), Removal of fluoride from contaminated drinking water using unmodified and aluminium hydroxide impregnated blue lime stone waste. *Separation Science and Technology*, **44** (6), 1436-1451.

Full Text: [2009\Sep Sci Tec44, 1436.pdf](2009/Sep%20Sci%20Tec44,%201436.pdf)

Abstract: The adsorption of fluoride on lime stone (LS) and aluminium hydroxide impregnated lime stone (AlLS) was investigated using a batch adsorption technique. A series of experiments were under taken in an agitated batch adsorber to assess the effect of the system variables such as solution pH, dye concentration and temperature. Removal of fluoride was observed to be the most effective at pH 8. The langmuir and Freundlich isotherm models were applied to the equilibrium data. The results showed that the Freundlich equation fits better than the Langmuir equation. The maximum sorption capacities for the LS and AlLS adsorbents were found to be 43.10mg/g and AlLS 84.03mg/g respectively. The FTIR studies indicate that the adsorption of fluoride is physiorption. The adsorption of fluoride onto AlLS proceeds according to a pseudo-first-order model. The results reveal that the LS and AlLS can be economical for the removal of fluoride compared to many other expensive adsorbents.

Keywords: Adsorption, Adsorption Isotherm, Aqueous-Solution, Carbon, Defluoridation, Dialysis, Equilibrium, Fluoride, Impregnation, Isotherm, Kinetic Equation, Lime Stone, Powder, Removal

? Jain, S. and Jayaram, R.V. (2009), Removal of fluoride from contaminated drinking water using unmodified and aluminium hydroxide impregnated blue lime stone waste. *Separation Science and Technology*, **44** (6), 1436-1451.

Full Text: [2009\Sep Sci Tec44, 1436.pdf](2009/Sep%20Sci%20Tec44,%201436.pdf)

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Full Text: [2009\Sep Sci Tec44, 1452.pdf](2009/Sep%20Sci%20Tec44,%201452.pdf)

Abstract: The batch adsorption experiments were carried out using low-cost agricultural by-products, wheat bran and rice bran, for the removal of Congo red from aqueous solution at pH 8.0 and temperature of 25C. Effects of important parameters such as contact time, adsorbent concentration, adsorbent modification and ion strength were investigated. The raw biomass and loaded Congo red biomass were characterized by FT-IR. The pseudo-first order equation and pseudo-second order equation were tested and the results showed that adsorption of Congo red followed the pseudo-second order very well. The Langmuir and Freundlich equations were applied to the data related to the adsorption isotherms and the observed maximum adsorption capacities (qm) were 22.73 and 14.63mg g-1 for wheat bran and rice bran, respectively. The effects of adsorbent concentration and ionic strength on the Congo red adsorption were marked. The adsorption performance has been significantly improved using rice bran modified by [image omitted].

Keywords: Activated Carbon, Adsorbent, Adsorption, Biosorption, Congo Red, Degradation, Dye Removal, Equilibrium, Heavy-Metal, Isotherm, Kinetics, Kinetics, Low-Cost Adsorbent, Methylene-Blue, Waste-Water

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Full Text: [2009\Sep Sci Tec44, 1638.pdf](2009/Sep%20Sci%20Tec44,%201638.pdf)

Abstract: The treated almond peels (TAP) have been employed as adsorbents for the removal of Brilliant green dye from waste water. The nature of possible adsorbent and dye interaction was examined by the FTIR and SEM technique. The adsorption of BG was found to be maximum (93%) at pH 8. The extent of removal of BG was found to be dependent on the adsorbent dose, the temperatures, and the times. The equilibrium data for adsorption was best represented by the Langmuir isotherm. Thermodynamic parameters (ΔH and ΔG) suggest endothermic and spontaneous process. Kinetic studies show better applicability of second-order kinetic model. The practical utility of TAP was demonstrated by removing BG from pure solution and industrial effluent system by column process. It was found that the removal effficiency of TAP was better by pure solution. The breakthrough capacities of pure solution and industrial effluent systems on TAP are found to be 30 and 17 mg, g, respectively.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Characteristics, Almond, Aqueous-Solution, Biosorption, Breakthrough, Brilliant Green, Capacity, Characterization, Column, Data, Desorption, Desorption, Dye, Dye Adsorption, Effluent, Endothermic, Equilibrium, FTIR, Industrial Effluent, Interaction, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Model, Palm-Fruit Bunch, pH, Recovery, Removal, Second Order, Second-Order, SEM, Solution, Sorption, Systems, Thermodynamic, Thermodynamic Parameters, Utility, Waste, Waste Water, Wastewater, Water, Wheat-Straw

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Full Text: [2009\Sep Sci Tec44, 2078.pdf](2009/Sep%20Sci%20Tec44,%202078.pdf)

Abstract: Textile dyes (Acid Yellow 17 and Acid Orange 7) were removed from its aqueous solution in batch and continuous packed bed adsorption systems by using thermally activated Euphorbia macroclada carbon with respect to contact time, initial dye concentration, and temperature. The activated carbon was prepared using a cheap plant-based material called Euphorbia macroclada, which was chemically modified with K2CO3. Lagergren-first-order and second-order kinetic models were used to fit the experimental data. Equilibrium isotherms were analyzed by Langmuir and Freundlich isotherms. Equilibrium data fitted well the Langmuir model in the studied temperature (25-55ºC) ranges. The maximum adsorption capacity of AY17 and AO7 onto activated carbon was found to be 161.29 and 455 mgg-1, respectively by Langmuir isotherm at 55°C. Breakthrough curves for column adsorption have also been studied. The desorption of dyes has been experimentally investigated using NaOH solution of pH 11.

Keywords: Acid Dye, Activated Carbon, Activation, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Aqueous Solution, Batch, Biomass, Capacity, Carbon, Column, Concentration, Continuous Packed Bed, Data, Desorption, Dye, Dyes, Equilibrium, Equilibrium Isotherms, Experimental, Freundlich, Isotherm, Isotherms, K2CO3, Kinetic, Kinetic Models, Kraft Lignin, Langmuir, Langmuir And Freundlich Isotherms, Langmuir Isotherm, Langmuir Model, Model, Models, Modified, Naoh, Packed Bed, Peat, pH, Physical Activation, Removal, Second Order, Second-Order, Shell, Solution, Systems, Temperature, Textile Dyes

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Full Text: [2009\Sep Sci Tec44, 2774.pdf](2009/Sep%20Sci%20Tec44,%202774.pdf)

Abstract: This study was to develop a new adsorbent, Iron(III) complex of an amino-functionalized polyacrylamide-grafted coconut coir pith (CP), a lignocellulosic residue, for the removal of phosphate from water and wastewater. The kinetics of adsorption follows a pseudo-second-order model. The equilibrium sorption capacity of 96.31 mg/g was determined at 30°C from the Langmuir isotherm equation. Complete removal of 16.4 mg/L phosphate in 1 L of fertilizer industry wastewater was achieved by 1.5 g/L AM-Fe-PGCP at pH 6.0. The acid treatment (0.1M HCl) and re-introduction of Fe3+ lead to a reactivation of the spent adsorbent and can be reused through many cycles of water treatment and regeneration without any loss in the adsorption capacity.

Keywords: Acid Treatment, Acid-Treatment, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous-Solutions, Capacity, Carbon, Chitosan, Coir Pith, Equilibrium, Fertilizer, Graft Copolymerization, Heavy-Metal Ions, Isotherm, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Lead, Model, pH, Phosphate, Phosphorus, Pith, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Regeneration, Removal, Removal Of Phosphate, Solids, Sorption, Sorption Capacity, Treatment, Wastewater, Wastewaters, Water, Water Treatment

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Full Text: [2009\Sep Sci Tec44, 2117.pdf](2009/Sep%20Sci%20Tec44,%202117.pdf)

Abstract: Ethylenediaminetetraacetic dianhydride (EDTAD) modified sugarcane bagasse (SB) was prepared and characterized by Fourier transform infrared spectroscopy (FTIR). Due to the presence of a large number of carboxyl groups, the adsorption capacity of the EDTAD modified SB (EDTAD-SB) for malachite green (MG) showed a significant increase compared with SB. Increase in ion strength of solution-induced decline of MG sorption. The maximum adsorption capacities were 157.2 mg g-1 for MG, according to the Langmuir equation. Kinetic studies showed better correlation coefficients for a pseudo-second-order kinetic model, confirming that the sorption rate was controlled by a chemisorption process.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Capacity, Aqueous-Solutions, Bagasse, Capacity, Chemisorption, Correlation, Dye, Equilibrium, Ethylenediaminetetraacetic Dianhydride, Fiber, FTIR, Infrared Spectroscopy, Ion Strength, Ions, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Equation, Malachite Green, Mg, Model, Modified, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sorption, Spectroscopy, Strength, Sugarcane, Sugarcane Bagasse

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Full Text: [2009\Sep Sci Tec44, 3128.pdf](2009/Sep%20Sci%20Tec44,%203128.pdf)

Abstract: This work reports a study about the adsorption of Rhodamine B (RB) by unloaded polyether type polyurethane foam (PUF) in a medium containing sodium dodecylsulfate (SDS). The adsorption process was based on the formation of an ionic-pair between RB and SDS, which presented high affinity by PUF. Adsorption was characterized in relation to equilibrium, kinetic, and thermodynamic aspects and the results obtained showed that the ratio between the SDS and RB concentrations played an important role on the adsorption efficiency. A maximum adsorption capacity of 6.85×10-6 molRBg-1 was observed at established experimental conditions. The adsorption process was spontaneous (negative G) and presented an endothermic characteristic (positive H). Also, its rate was regulated by an intraparticle diffusion process. Sequential extraction experiments were carried out by changing PUF plugs in 30 and 60min time intervals, resulting in removal rates higher than 95%.

Keywords: Adsorption, Adsorption Capacity, Basic-Dyes, Capacity, Cationic Dye, Cationic Dyes, Diffusion, Efficiency, Endothermic, Equilibrium, Experimental, Experiments, Extraction, Foam, Intervals, Intraparticle Diffusion, Kinetic, Malachite-Green, Metal-Ions, Methylene-Blue, Polyurethane, Polyurethane Foam, Rates, Reactive Dyes, Removal, Rhodamine B, Role, Sds, Sodium, Solid-Phase Extraction, Sorption, Thermodynamic, Water, Work

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Full Text: [2009\Sep Sci Tec44, 3150.pdf](2009/Sep%20Sci%20Tec44,%203150.pdf)

Abstract: A process for the removal of two chlorophenols (2-chlorophenol and 2,4-dichlorophenol) from water using surface modified mango seed waste by adsorption process followed by cement fixation of the phenols-laden adsorbent is investigated. The two main objectives of this study were to develop efficient adsorbent utilizing mango seed waste by physiochemical activation and to an environmentally-friendly disposal of phenols-laden adsorbent into cement by a fixation process. The results of the present study reveal that the modified mango seed adsorbent showed an efficient adsorption potential for chlorophenols removal from water. The maximum adsorption potential of modified mango seed adsorbent for 2-chlorophenol and 2,4-dichlorophenol was 40.6 and 72.3mgg-1, respectively at 25ºC. Adsorption kinetic data of chlorophenols adsorption on mango seed adsorbent could be described more favorably by a pseudo-second-order kinetic model. After the adsorption studies, the phenol-laden adsorbent was immobilized in cement for its ultimate disposal. Leachates from the fixed phenols-laden adsorbent exhibit phenols concentrations lower than the drinking water standards. Results from this study suggest the potential utility of agricultural wastes as one of the most promising activated carbon precursors for phenols removal from water and wastewater and the safe disposal of phenol-laden adsorbent into cement by fixation process.

Keywords: 2,4-Dichlorophenol, 2-Chlorophenol, Activated Carbon, Activation, Adsorbent, Adsorption, Adsorption Kinetic, Adsorption Study, Agricultural, Agricultural Waste, Agricultural Wastes, Aqueous-Solutions, Carbon, Cement, Cement Fixation, Chlorinated Phenols, Chlorophenols, Chlorophenols, Data, Degradation, Disposal, Drinking Water, Drinking Water Standards, Environmentally Friendly, Equilibrium, Immobilized, Kinetic, Kinetic Model, Mango Seed Waste, Model, Modified, Phenols, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sorption, Standards, Substituted Phenols, Surface, Surface Modification, Utility, Waste, Wastewater, Water, Water Standards

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Full Text: [2009\Sep Sci Tec44, 3735.pdf](2009/Sep%20Sci%20Tec44,%203735.pdf)

Abstract: Adsorptive removal of the dyes C.I. Basic Blue 9, C.I. Basic Red 2, and C.I. Acid Blue 74 from aqueous solution onto the activated carbon cloth (ACC) has been investigated. The removal of each dye has been followed by in-situ UV-visible spectroscopic method using the so-called scanning kinetics technique. Kinetic data obtained in this way were tested according to pseudo-first order, pseudo-second order, Elovich, and intraparticle diffusion models. Pseudo-second order model was found to be the best in representing the experimental kinetic data. Adsorption isotherms at 30ºC were derived for each dye. Isotherm data were found to fit best to Freundlich isotherm model among the three isotherm models tested, Langmuir, Freundlich, and Redlich-Peterson. High specific surface area of the ACC allowed almost complete removal of each dye under the experimental conditions applied. Adsorption capacity of the ACC for the three dyes was correlated with the dimensions of dye molecules and pore sizes of the ACC.

Keywords: Acid, Activated Carbon, Activated Carbon Cloth, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solution, Aqueous-Solutions, Basic Blue 9, Capacity, Carbon, Data, Diffusion, Dye, Dyes, Electrosorption, Elovich, Equilibrium, Experimental, Felt Electrodes, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, In Situ, In-Situ UV Spectroscopy, Intraparticle Diffusion, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetics, Langmuir, Methylene-Blue, Model, Models, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Redlich-Peterson, Removal, Solution, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Waste-Water Purification

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Full Text: [2010\Sep Sci Tec45, 94.pdf](2010/Sep%20Sci%20Tec45,%2094.pdf)

Abstract: In this work, calcined and uncalcined mixed clays containing kaolin, ball clay, feldspar, pyrophyllite, and quartz are examined as a potential adsorbent for the removal of crystal violet dye from aqueous solution. These clays are characterized by nitrogen adsorption/desorption isotherms, X-ray diffraction (XRD), Fourier transform infrared (FT-IR) spectroscopy, and thermo gravimetric analysis (TGA). The kinetics and thermodynamic parameters as well as the effects of the pH, the temperature, and the adsorbent dosage have also been investigated. The experimental results indicate that the Langmuir model expresses the adsorption isotherm better than the Freundlich model. The obtained result showed a tremendous increase in the crystal violet adsorption capacity (1.9×10-3 mol g-1) after calcination, which is one order greater than that of the uncalcined mixed clay. The mechanism of the adsorption process is elucidated on the basis of experimental data. The percentage removal of crystal violet dye increases with increasing the pH, the temperature, and the adsorbent dosage. The investigation of kinetic studies indicates that the adsorption of crystal violet on calcined and uncalcined mixed clays could be described by the pseudo-second-order model. The negative G0 values obtained from the thermodynamic investigation confirm that the adsorption is spontaneous in nature. The adsorption results suggest that the calcined and uncalcined mixed clays can also be used as low cost alternatives to the expensive activated carbon for the removal of dyes from aqueous solution.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption, Desorption, Alternatives, Analysis, Aqueous Solution, Basic Dye, Calcination, Calcined, Capacity, Carbon, Clay, Clays, Cost, Crystal Violet, Data, Dye, Dyes, Equilibrium, Experimental, Freundlich, Freundlich Model, FT-IR, FTIR, Investigation, Isotherm, Isotherms, Kaolin, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Low Cost, Mechanism, Methylene-Blue, Model, Nitrogen, Organic-Dyes, Palygorskite, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pyrophyllite, Quartz, Removal, Removal Of Dyes, Solution, Sorption, Spectroscopy, Temperature, TGA, Thermodynamic, Thermodynamic Parameters, Water, Work, X-Ray, X-Ray Diffraction, XRD

? Yüksel, S. and Yürüm, Y. (2010), Removal of boron from aqueous solutions by adsorption using fly ash, zeolite, and demineralized lignite. *Separation Science and Technology*, **45** (1), 105-115.

Full Text: [2010\Sep Sci Tec45, 105.pdf](2010/Sep%20Sci%20Tec45,%20105.pdf)

Abstract: In the present study for the purpose of removal of boron from water by adsorption using adsorbents like fly ash, natural zeolite, and demineralized lignite was investigated. Boron in water was removed with fly ash, zeolite, and demineralized lignite with different capacities. Ninety-four percent boron was removed using fly ash. Batch experiments were conducted to test the removal capacity, to obtain adsorption isotherms, thermodynamic and kinetic parameters. Boron removal by all adsorbents was affected by pH of solution, maximum adsorption was achieved at pH 10. Adsorption of boron on fly ash was investigated by the Langmuir, Freundlich, and the Dubinin-Radushkevich models. Standard entropy and enthalpy changes of adsorption of boron on fly ash were, S0=-0.69kJ/mol K and H0=-215.34kJ/mol, respectively. The negative value of S0 indicated decreased randomness at the solid/solution interface during the adsorption boron on the fly ash sample. Negative values of H0 showed the exothermic nature of the process. The negative values of G0 implied that the adsorption of boron on fly ash samples was spontaneous. Adsorption of boron on fly ash occurred with a pseudo-second order kinetic model, and intraparticle diffusion of boron species had also some effect in adsorption kinetics.

Keywords: Activated Alumina, Adsorbents, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Boric-Acid, Boron, Boron Removal, Capacity, Changes, Coal, Diffusion, Enthalpy, Entropy, Exothermic, Experiments, Fly Ash, Freundlich, Hybrid Process, Interface, Intraparticle Diffusion, Ion-Exchange-Resin, Isotherms, Kinetic, Kinetic Model, Kinetic Parameters, Kinetics, Langmuir, Lignite, Mineral Matrix, Model, Models, Natural, Natural Zeolite, Oil-Shale, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Purpose, Randomness, Removal, Reverse-Osmosis, Solution, Sorption-Elution, Species, Thermodynamic, Turkey, Value, Waste-Water, Water, Zeolite

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Full Text: [2010\Sep Sci Tec45, 129.pdf](2010/Sep%20Sci%20Tec45,%20129.pdf)

Abstract: The present study reports the feasibility of two synthetic crystalline lamellar nano-silicates, sodic magadiite (Na-mag) and its converted acidic form (H-mag), as alternative adsorbents for the removal of the dye methylene blue (MB) from aqueous solutions. The ability of these adsorbents for removing the dye was explored through the batch adsorption procedure. Effects such as the pH and the adsorbent dosage on the adsorption capacities were explored. Four kinetic models were applied, the adsorption being best fitted to a fractionary-order kinetic model. The kinetic data were also adjusted to an intra-particle diffusion model to give two linear regions, indicating that the kinetics of adsorption follows multiple sorption rates. The equilibrium data were fitted to Langmuir, Freundlich, Sips, and Redlich-Peterson isotherm models. The maxima adsorption capacities for MB of Na-mag and H-mag were 331 and 173mg g-1, respectively.

Keywords: Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption, Adsorption Capacities, Alternative, Anionic Dyes, Aqueous Solutions, Azo Dyes, Batch, Batch Adsorption, Biosorbent, Data, Diffusion, Diffusion Model, Dye, Equilibrium, Feasibility, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics of Adsorption, Langmuir, Magadiite, Mb, Methylene Blue, Model, Models, Multiple Sorption, Nanomaterial, Parameters, Pecan Nutshell, pH, Phyllosilicate, Procedure, Rates, Reactive Dyes, Redlich-Peterson, Removal, Silicic-Acid, Solutions, Sorption, Thin Chitosan Membranes, Yellow Passion-Fruit

? Çalişkan, E. and Göktürk, S. (2010), Adsorption characteristics of sulfamethoxazole and metronidazole on activated carbon. *Separation Science and Technology*, **45** (2), 244-255.

Full Text: [2010\Sep Sci Tec45, 244.pdf](2010/Sep%20Sci%20Tec45,%20244.pdf)

Abstract: In this work, the removal of two pharmaceuticals i.e., an antibiotic drug, sulfamethoxazole and an antiparasitary drug, metronidazole onto activated carbon from aqueous solutions were studied. Batch adsorption studies were carried out at different pH, adsorbent concentrations, and temperatures. Adsorption isotherms have been modeled by Freundlich, Langmuir, and Dubinin-Raduskevitch (D-R) equations. The adsorption of these drugs was better represented by the Langmuir equation. The effect of the solution pH on the adsorbed amount of SM and MN was studied by varying the initial pH under constant process parameters at equilibrium conditions. The increase in pH of the solutions caused to decrease adsorption of SM and MN on AC. The kinetics of adsorption in view of three kinetic models, i.e., the first-order Lagergren model, the pseudo-second-order model, and the intraparticle diffusion model was discussed. The pseudo-second-order kinetic model describes the adsorption of both sulfamethoxazole and metronidazole on activated carbon. Rate constants for adsorption and desorption, and surface coverage have been evaluated with the help of another approach of the kinetic scheme. The effect of temperature was also studied at the range between 293 and 313 K. Thermodynamic parameters were calculated. The negative value of enthalpy change (ΔHº) indicated the exothermic nature of the adsorption process, and the negative values of free energy change (ΔGº) were indicative of spontaneity of the adsorption process. In this work adsorption behaviour of SM and MN on activated carbon was also evaluated by the data obtained from column experiments.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherms, Approach, Aqueous Solutions, Aqueous-Solutions, Batch Adsorption, Behaviour, Carbon, Column, Column Experiments, Coverage, Data, Desorption, Diffusion, Diffusion Model, Drinking-Water, Drug, Drugs, Energy, Enthalpy, Equilibrium, Exothermic, Experiments, First Order, Freundlich, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics Of Adsorption, Lagergren Model, Langmuir, Langmuir Equation, Metronidazole, Mn, Model, Models, pH, pH Effect, Pharmaceutical Residues, Pharmaceuticals, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pseudo-Second-Order Model, Range, Rate Constants, Removal, Risk-Assessment, Solution, Solutions, Sorption, Spent Bleaching Earth, Sulfamethoxazole, Surface, Surface Coverage, Temperature, Thermodynamic, Thermodynamic Parameters, Value, Waste-Water, Work

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Full Text: [2010\Sep Sci Tec45, 262.pdf](2010/Sep%20Sci%20Tec45,%20262.pdf)

Abstract: A Ca-deficient hydroxyapatite(d-HAp) has been used to remove lead and cadmium from their mixed ions solution. The effect of pH, coexistent calcium and magnesium ions, and humic acid on the adsorption efficiency were investigated. The results showed that this d-HAp adsorbed both Cd2+ and Pb2+ efficiently within a wide pH range. The existence of humic acid reduced the removal efficiency of Cd2+ and Pb2+. The addition of Ca2+ and Mg2+ with a concentration of 500 mg/L only slightly reduced the removal efficiency. The adsorption kinetics was described by pseudo-second-order reaction model and the adsorption isotherm followed the Langmuir model.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solutions, Biosorption, Ca-Deficient Hydroxyapatite, Cadmium, Calcium, Cd2+, Concentration, Copper(II), Efficiency, Heavy-Metals, Humic Acid, Hydroxyapatite, Ions, Isotherm, Kinetics, Langmuir, Langmuir Model, Lead, Magnesium, Model, Pb2+, pH, Pseudo Second Order, Pseudo-Second-Order, Range, Removal, Removal Efficiency, Solution, Sorption, Waste-Water

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Full Text: [2010\Sep Sci Tec45, 277.pdf](2010/Sep%20Sci%20Tec45,%20277.pdf)

Abstract: Competitive adsorption of Ag+, Pb2+, Ni2+, and Cd-2 ions on vermiuculite in a binary, ternary, and quaternary mixture was investigated in batch experiments. The effects of the presence of Ag+, Ni2+, and Cd2+ ions on the adsorption of Pb2+ ions were investigated in terms of the equilibrium isotherm. Experimental results indicated that Pb2+ ions always favorably adsorbed on vermiculite over Ag+, Ni2+, and Cd2+ ions. The adsorption equilibrium data of Pb2+ ions better fitted the Langmuir model than the Freundlich model. The results showed that the pseudo-second-order kinetics model was in good agreement with the experimental results for all metal ions, and the adsorption rate among the metal ions followed Ag+ > Pb2+ > Ni2+ > Cd2+. The desorption and regenration study indicated that vermiculite can be used repeatedly and be suitable for the design of a continuous process.

Keywords: Adsorption, Adsorption Equilibrium, Adsorption Rate, Aqueous-Solutions, Batch, Batch Experiments, Cadmium, Carbon, Cd2+, Competitive Adsorption, Cu2+, Data, Design, Desorption, Equilibrium, Equilibrium Isotherm, Experimental, Experiments, Fly-Ash, Freundlich, Freundlich Model, Hydroxyaluminosilicate-Montmorillonite Complexes, Ions, Isotherm, Kinetics, Kinetics Model, Langmuir, Langmuir Model, Lead, Metal, Metal Ion, Metal Ions, Metal Removal, Model, Ni2+, Pb2+, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Sorption, Vermiculite, Waste-Water

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Full Text: [2010\Sep Sci Tec45, 288.pdf](2010/Sep%20Sci%20Tec45,%20288.pdf)

Abstract: A novel microspherical adsorbent for the removal of uranium from aqueous solutions was developed by immobilizing of natural bentonite in the polymeric matrix of calcium alginate. Different uptake properties of the prepared microspheres were examined using batch, stirred and column methods. The adsorbent showed high affinity toward uranium ions, especially at pHs above 3. Major uptake mechanisms included ion exchange, chelating of the (UO2)2+ ions to the -OH groups of alginate, and surface complexation with bentonite. Surprisingly, the capacity of microspheres was higher than both its constituents, revealing that a synergetic effect occurs. Adsorption kinetics was controlled by slow chemical reaction of UO22+ ions with bentonite, and it obeyed a shrinking core model. Also a pseudo-second order chemical reaction fairly fitted the kinetics data. The synthesized microsphrese, in addition to cost efficiency, showed a relatively good column performance and high durability and reusability.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Alginate, Alginate Microspheres, Aqueous Solutions, Batch, Bentonite, Biopolymer, Biosorption, Calcium, Calcium Alginate, Capacity, Characterization, Chemical, Column, Complexation, Cost, Cost-Efficiency, Data, Efficiency, Equilibrium, Exchange, Extraction, Ion Exchange, Ion-Exchange, Ions, Kinetics, Matrix, Mechanisms, Methods, Microspheres, Model, Natural, Performance, Phosphoric-Acid, Polymeric, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Reusability, Selectivity, Solutions, Sorption, Surface, Surface Complexation, Synergetic Effect, Synthesis, Trivalent, UO22+, Uptake, Uranium

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Full Text: [2010\Sep Sci Tec45, 370.pdf](2010/Sep%20Sci%20Tec45,%20370.pdf)

Abstract: This study uses a waste iron oxide material (BT3), which is a by-product of the fluidized-bed Fenton reaction (FBR-Fenton), for the treatment of a fluoride (F-) solution. The purpose of this study is to investigate a low-cost sorbent as a replacement for the current costly methods of removing fluoride from wastewater. X-ray powder diffraction (XRD) and scanning electron microscopy (SEM) are used to characterize the BT3. Contact time, F- concentration (from 0.75 to 6mmol L-1), and temperature (from 303 to 323K) are used as operation parameters to treat the fluoride. The highest F- adsorption capacity of the BT3 adsorbent was determined to be 1.17mmol g-1 (22.2mg g-1) for a 6mmol L-1 initial F- concentration at pH 3.9±0.2 and 303±1K. Adsorption data were well described by the Langmuir model, and the thermodynamic constants of the adsorption process, Gº, Hº, and Sº, were evaluated as -1.63kJ mol-1 (at 303K), -1.75kJ mol-1, and -52.4J mol-1 K-1, respectively. Additionally, a pseudo-second-order rate model was adopted to describe the kinetics of adsorption. BT3 could be regenerated with NaOH, and the regeneration efficiency reached 95.1% when the concentration of NaOH was 0.05mol L-1.

Keywords: Activated Alumina, Adsorbent, Adsorption, Adsorption Capacity, Capacity, Catalytic-Oxidation, Coated Sand, Concentration, Data, Donnan Dialysis, Drinking-Water, Efficiency, Electron Microscopy, Equilibrium, F, Fenton, Fluidized Bed, Fluidized-Bed Reactor, Fluoride, Ions, Iron, Iron Oxide, Iron-Oxide, Kinetic, Kinetics, Kinetics of Adsorption, L1, Langmuir, Langmuir Model, Low Cost, Low-Cost Materials, Methods, Model, NaOH, Operation, Oxide, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Purpose, Regeneration, Removal, Scanning Electron Microscopy, SEM, Solution, Sorbent, Temperature, Thermodynamic, Treatment, Waste, Wastewater, X-Ray, XRD

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Full Text: [2010\Sep Sci Tec45, 370.pdf](2010/Sep%20Sci%20Tec45,%20370.pdf)

Abstract: Batch and column adsorption experiments were conducted to investigate the removal of dyes from wastewater by water nut modified carbon (WNMC). Acidic pH was favorable for adsorption for Congo red dyes and basic pH was favorable for the adsorption for Malachite green dyes. The surface property of the sorbent was characterized by scanning electron microscopy and Fourier transform infrared techniques. The adsorption process was found to be endothermic and spontaneous. Different models of adsorption were used to describe the kinetics data and to calculate the corresponding rate constants of WNMC surfaces for dyes adsorption. A mechanism of dyes adsorption associating chemisorption processes is presented allowing the discussion of the variations in adsorption behavior of the material. These data suggested that WNMC are promising materials for dyes sorption. The data were in good agreement with bed depth service time model.

Keywords: Activated Carbons, Adsorption, Adsorption Behavior, Adsorption Characteristics, Aqueous-Solution, BDST, Behavior, Breakthrough Capacity, Carbon, Characterization, Chemisorption, Column, Congo Red, Data, Decolorization, Dye, Dyes, Electron Microscopy, Endothermic, Experiments, Fixed Bed Column, Kinetics, Kinetics, Malachite Green, Mechanism, Metal-Ions, Methylene-Blue, Model, Models, Modified, Modified Carbon, pH, Phosphoric-Acid, Property, Rate Constants, Remediation, Removal, Removal of Dyes, Scanning Electron Microscopy, Service, Sorbent, Sorption, Surface, Surfaces, Techniques, Wastewater, Water, WNMC

? Sari, A. and Tuzen, M. (2010), Biosorption of As(III) and As(V) from aqueous solution by lichen (*Xanthoria parietina*) biomass. *Separation Science and Technology*, **45** (4), 463-471.

Full Text: [2010\Sep Sci Tec45, 463.pdf](2010/Sep%20Sci%20Tec45,%20463.pdf)

Abstract: The biosorption of As(III) and As(V) from aqueous solution on lichen (*Xanthoria parietina*) biomass were investigated using different experimental parameters such as solution pH, biomass concentration, contact time, and temperature. The equilibrium data were evaluated by Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) isotherm models. The biosorption capacity of X. parietina for As(III) and As(V) was found to be 63.8mg/g and 60.3mg/g. The mean sorption energy values calculated from D-R model indicated that the biosorption of As(III) and As(V) onto X. parietina biomass took place by chemical ion-exchange. The thermodynamic parameters showed that the biosorption of As(III) and As(V) ions onto X. parietina biomass was feasible, spontaneous, and exothermic in nature. Kinetic examination of the sorption data revealed that the biosorption processes of both As(III) and As(V) followed well the pseudo-second-order kinetics. The arsenic ions were desorbed from X. parietina using both 1M HCl and 1M HNO3. The recovery yield of arsenic ions was found to be 80-90% and the biosorbent had good reusability after consecutive seven sorption-desorption cycles.

Keywords: Accumulation, Activated Carbon, Adsorptive Removal, Aqueous Solution, Arsenic, Arsenic Ions, Arsenic Removal, As(III), As(V), Biomass, Biomonitor, Biosorbent, Biosorption, Capacity, Chemical, Cladonia-Furcata, Concentration, Data, Drinking-Water, Energy, Equilibrium, Examination, Exothermic, Experimental, Filtration, Freundlich, Hypogymnia-Physodes, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Model, Models, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Recovery, Solution, Sorption, Sorption-Desorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Xanthoria Parietina

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Full Text: [2010\Sep Sci Tec45, 472.pdf](2010/Sep%20Sci%20Tec45,%20472.pdf)

Abstract: Fluoride removal with varying different parameters at 303±1.6K and pH 6.5±0.2 was investigated by hydrous iron(III)-chromium(III) bimetal oxide. The kinetic and equilibrium data fitted with the pseudo-second order and Langmuir isotherm equations very well (R2=0.99-1.00), respectively. The Langmuir capacity and free energy (EDR) of adsorption evaluated were 16.34 (±0.50) mg center dot g-1 and 15.81kJ center dot mol-1, respectively. The estimated thermodynamic parameters viz. H0, G0, and S0 indicated that the reaction was endothermic but spontaneous for entropy increase. The small-scale column filtration of high fluoride (C0=7.37mg center dot L-1) water gave encouraging results.

Keywords: Adsorption, Alumina, Aqueous-Solution, Capacity, Carboxylated Chitosan Beads, Column, Data, Defluoridation, Desorption, Drinking-Water, Endothermic, Energy, Entropy, Equilibrium, Filtration, Fixed-Bed, Fluoride, Fluoride Removal, Iron-Chromium Mixed Oxide, Isotherm, Isotherm Equations, Kinetic, Kinetics, Kinetics, L1, Langmuir, Langmuir Isotherm, Low-Cost Materials, Oxide, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Water

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Full Text: [2010\Sep Sci Tec45, 486.pdf](2010/Sep%20Sci%20Tec45,%20486.pdf)

Abstract: The efficacy of treated Shorea dasyphylla bark for Cu(II) and Cr(VI) adsorption was assessed in a batch adsorption system as a function of pH, agitation period, and initial metal concentration. The equilibrium nature of Cu(II) and Cr(VI) adsorption was described by the Freundlich, Langmuir, and Dubinin-Radushkevich isotherms. The maximum monolayer capacities of treated Shorea dasyphylla bark, estimated from the Langmuir equation were 184.66 and 42.72mg/g for Cu(II) and Cr(VI), respectively. The experimental results were fitted using pseudo-first order, pseudo-second order and intraparticle diffusion kinetic models, the pseudo-second order showed the best conformity to the kinetic data. Thermodynamic parameters such as enthalpy change (*H*º), free energy change (*G*º) and entropy change (*S*º) were determined by applying the Van’t Hoff equation. The adsorption of Cu(II) and Cr(VI) onto treated Shorea dasyphylla bark was found to be spontaneous and exothermic. The adsorption mechanism was confirmed by means of Fourier transform infrared (FTIR) and Energy dispersive X-ray (EDX) spectroscopy. The dimensionless constant separation factor (RL), indicated that treated Shorea dasyphylla bark was favorable for Cu(II) and Cr(VI) adsorption.

Keywords: Adsorption, Adsorption Mechanism, Agitation, Aqueous-Solution, Bark, Batch, Batch Adsorption, Chitosan, Chromium, Concentration, Cr(VI), Cr(VI) Adsorption, Cu(II), Data, Diffusion, EDX, Efficacy, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Experimental, Freundlich, FTIR, Function, Heavy-Metals, Intraparticle Diffusion, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Equation, Low-Cost Adsorbents, Mechanism, Metal, Models, Monolayer, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Remediation, Removal, Sawdust, Separation, Sorption, Spectroscopy, Thermodynamic, Thermodynamic Parameters, Treated Bark, Waste-Water, X-Ray

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Full Text: [2010\Sep Sci Tec45, 525.pdf](2010/Sep%20Sci%20Tec45,%20525.pdf)

Abstract: A novel immobilized metal affinity membrane was prepared for papain adsorption in this article. Higher papain adsorption capacity between 43-67 mg/g was observed and the adsorption isotherm fitted the Freundlich equation. Experimental data were analyzed using two adsorption kinetic models. The pseudo-second-order kinetic model provided better correlation to the experimental results. A significant amount of the adsorbed papain was eluted by 1.0M NaSCN at pH 5.0 for all affinity membranes. It was concluded that the novel chitosan-coated nylon-based immobilized metal ion affinity membrane could be applied for the large-scale isolation of papain without resulting in enzyme denaturation.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetic, Affinity Membrane, Aqueous-Solutions, Capacity, Cellulose, Chromatography, Co2+, Correlation, Cu2+, Data, Exchange, Experimental, Freundlich, Freundlich Equation, Immobilized, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Lysozyme, Membrane, Metal, Metal Ion, Model, Models, Ni2+, Papain, pH, Protein, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Purification, Removal, Separation, Zn2+

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Full Text: [2010\Sep Sci Tec45, 681.pdf](2010/Sep%20Sci%20Tec45,%20681.pdf)

Abstract: The *Sphingomonas paucimobilis* biomass has been successfully utilized to degrade several persistent organic pollutants (POPs). However, few studies have been conducted to use it to remove heavy metals from aqueous solutions. In the present study, biosorption experiments for Cr (VI) were investigated using nonliving biomass of S. paucimobilis isolated from activated sludge, Lianyungang Dapu sewage treatment plant, China. The effects of several parameters including solution pH, contact time, and ionic strength, etc. on Cr (VI) uptake were studied. The biomass was characterized by scanning electron microscopy and energy dispersive X-ray spectroscopy (SEM-EDS) and Fourier transform infrared spectrometer (FTIR). The applicability of the Langmuir and Freundlich models was tested. The correlation coefficients (R) of both models were greater than 0.95. The maximum adsorption capacities were found to be 28.5mg/g for Cr (VI) at 20ºC. The adsorption process was quick and found to follow the pseudo-second-order equation. The optimum adsorption was achieved at pH 2. The adsorption was also NaCl concentrations dependent.

Keywords: Activated Sludge, Adsorption, Adsorption Capacities, Aqueous Solutions, Biomass, Biosorption, China, Correlation, Cr(VI), Cr(VI) Biosorption, Electron Microscopy, Energy, Experiments, Freundlich, FTIR, Heavy Metals, Ionic Strength, Langmuir, Metal-Ions, Metals, Models, NaCl, Organic, Organic Pollutants, Persistent Organic Pollutants, pH, Plant, Pollutants, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Scanning Electron Microscopy, Separation, Sewage, Sludge, Solution, Solutions, Spectroscopy, Sphingomonas paucimobilis Biomass, Strength, Treatment, Uptake, X-Ray

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Full Text: [2010\Sep Sci Tec45, 700.pdf](2010/Sep%20Sci%20Tec45,%20700.pdf)

Abstract: The adsorption of five phenolic compounds of four different classes from aqueous batch solutions onto four styrene-divinylbenzene and acrylic resins (EXA 90, EXA 118, XAD 7, and XAD 16) was investigated regarding their equilibria, kinetics and surface-energy heterogeneity, and mechanisms of adsorption. The experimental equilibrium data were very well fitted to Langmuir and Freundlich models (R2 0.900). Three kinetic models (pseudo-first-order, pseudo-second-order, and an intra-particle diffusion model) were suitable for describing the experimental data, the pseudo-second-order kinetic model being the best one (p 0.001). The adsorption energy values were low (19.00 kJ/mol), suggesting a physical adsorption process. Driving forces involved in the adsorption of the phenolic compounds onto the resins were hydrogen bonding, - stacking and hydrophobic interactions.

Keywords: Adsorbents, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Adsorption Mechanisms, Batch, Data, Diffusion, Diffusion Model, Energy, Equilibria, Equilibrium, Experimental, Extract, Flavonoids, Flavonoids, Freundlich, Hesperidin, Heterogeneity, Hydrogen, Hydrogen Bonding, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Macroporous Synthetic Resins, Mechanisms, Model, Models, Phenolic Acids, Physical, Pi-Stacking Interactions, Polyphenols, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Resins, Selective Adsorption, Solutions, Sorption, Surface Energy, Water, XAD Resins

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Full Text: [2010\Sep Sci Tec45, 776.pdf](2010/Sep%20Sci%20Tec45,%20776.pdf)

Abstract: Biosorption of As(V) was carried out using *Paecilomyces variotii* biomass in batch and column mode experiments. Various pretreatments like autoclaving (APV), iron doping (FePV), and PVP K25 doping (PVPPV) of biomass were carried out to increase and compare the adsorption efficiency of As(V) onto the biomass. At maximum concentration of 2.5mg/L of As(V), the removal was observed to be 58.4, 51.29, and 47.7% with FePV, PVPPV, and APV biomass respectively. PVPPV required comparatively less time (135min) to attain equilibrium when compared to other adsorbents (165min). FePV showed higher As(V) adsorption capacity (Qo) of 1.563mg/L in batch mode. The batch mode data were analysed using Langmuir and Freundlich isotherms and first order and pseudo second-order kinetic models. The maximum removal was observed at pH 2 with FePV. In column mode experiments, the change in the flow rate and the bed volume affected the adsorption capacity of the adsorbent. FePV showed maximum adsorption of As(V) in column mode experiments also. The desorption experiments revealed that the adsorbents could be reused so that it can be a cost-effective adsorbent for As(V) removal from drinking water.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Anions, Arsenic, Arsenic Removal, As(V), As(V) Adsorption, As(V) Removal, Batch, Batch And Column Mode, Batch Mode, Biomass, Biosorption, Capacity, Carbon, Column, Concentration, Cost-Effective, Data, Desorption, Drinking Water, Efficiency, Equilibrium, Experiments, First, First Order, Flow, Flow Rate, Freundlich, Fungal Biomass, Groundwater, Iron, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Metal-Ions, Mode, Models, Paecilomyces Variotii, pH, Pretreatments, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Pvp K25, Removal, Second Order, Second-Order, Separation, Volume, Waste-Water, Water

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Full Text: [2010\Sep Sci Tec45, 786.pdf](2010/Sep%20Sci%20Tec45,%20786.pdf)

Abstract: Magnesium, nickel, and cobalt hydrotalcite-like compounds (MgAlHT, NiAlHT, and CoAlHT) were used to remove fluoride ions from aqueous solutions and drinking water in batch and column systems. Mg, Ni, and Co hydrotalcite like compounds with similar M2+:Al3+ ratios were synthesized. F- ions were determined in the remaining solutions using a fluoride ion selective electrode. Kinetic of the fluoride sorption from aqueous solutions by hydrotalcite-like compounds (HT) was best described by the pseudo-second-order model and the equilibrium was reached in less than 200 minutes for all cases (MgAlHT, NiAlHT and CoAlHT), however, this behavior was not observed for fluoride sorption from drinking water by NiAlHT. The sorption isotherms of the fluoride ion by hydrotalcite like compounds could be best fitted to the Langmuir and Freundlich models. NiAlHT showed the highest efficiency for the removal of fluoride ions from aqueous solutions in batch system. The removal of fluoride ions by NiAlHT from aqueous solutions was more efficient than from drinking water in both batch and column systems.

Keywords: Adsorption, Anionic Clays, Aqueous Solutions, Batch, Batch System, Behavior, Cadmium, Co, Cobalt, Column, Defluoridation, Drinking Water, Efficiency, Effluents, Equilibrium, F, Fixed-Bed Column, Fluoride, Fluoride Ion, Freundlich, Hydrotalcite, Hydrotalcite-Like Compounds, Ion Selective Electrode, Ions, Isotherms, Kinetic, Langmuir, Lead(II), Magnesium, Model, Models, Nickel, Oxides, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Selective, Solutions, Sorption, Sorption Isotherms, Systems, Water

? Yang, J.S., Lee, J.Y., Park, Y.T., Baek, K. and Choi, J. (2010), Adsorption of As(III), As(V), Cd(II), Cu(II), and Pb(II) from aqueous solutions by natural muscovite. *Separation Science and Technology*, **45** (6), 814-823.

Full Text: [2010\Sep Sci Tec45, 814.pdf](2010/Sep%20Sci%20Tec45,%20814.pdf)

Abstract: Various parameters were tested for the application of natural muscovite (NM) in the removal of metals from aqueous solutions: contact time, pH, ionic strength, and initial metal concentrations. Kinetic studies showed that the pseudo-second-order model explains well the sorption process. The adsorption of metals was greatly influenced by solution pH but not by ionic strength. The results from isotherm studies agreed more with the Freundlich isotherm model than with the Langmuir isotherm model. The adsorbed quantity of metals by NM was lower than that by the purified mica. These results suggested that the composition and surface characteristics of natural minerals may seriously influence applications for water purification.

Keywords: (001)-Solution Interface, 001 Surface, Adsorbent, Adsorbents, Adsorption, Adsorption of Metals, Application, Aqueous Solutions, Arsenic, As(III), As(V), Cd(II), Characteristics, Complexes, Composition, Cu(II), Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Heavy-Metal-Adsorption, Ionic Strength, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Studies, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Metal, Metals, Mica, Mica, Minerals, Model, Natural, Nm, Pb(II), pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Purification, Removal, Solution, Solutions, Sorption, Sorption Process, Strength, Surface, Thermodynamics, Water, Water Interface, Water Purification

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Full Text: [2010\Sep Sci Tec45, 1066.pdf](2010/Sep%20Sci%20Tec45,%201066.pdf)

Abstract: Pure form, single phase, and highly crystalline low-silica zeolite Y was synthesized from natural nanotubular halloysite mineral by the hydrothermal method. In the synthesis process, the halloysite consisted of SiO2 and Al2O3 was used as starting material with adding supplementary silica and alumina sources. Ammonium adsorption properties of the as-synthesized zeolite Y were studied using batch experiments and the results revealed that its adsorption properties were strongly dependent on contact time, adsorbent dosage, pH, ionic strength, temperature, and initial concentration. The equilibrium data fit well with the Langmuir isotherm compared with the Freundlich isotherm. Kinetic studies showed that the adsorption followed the pseudo-second-order model. Thermodynamic parameters such as change in free energy (*G*0), enthalpy (*H*0), and entropy (*S*0) were also determined, which indicated that the adsorption of ammonium on zeolite Y was a spontaneous and exothermic process at ambient conditions. Due to its low cost, high adsorption capacity and fast adsorption rate, the zeolite Y synthesized from halloysite has the potential to be utilized for the cost-effective removal of ammonium from wastewater.

Keywords: Acid, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Properties, Adsorption Rate, Alumina, Ammonium, Aqueous-Solution, Batch, Batch Experiments, Capacity, Clinoptilolite, Concentration, Cost, Cost-Effective, Data, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Experiments, Faujasitic Zeolites, Fly-Ash, Freundlich, Freundlich Isotherm, Halloysite, Hydrothermal Method, Ion-Exchange, Ionic Strength, Isotherm, Kinetic, Kinetic Studies, Landfill Leachate, Langmuir, Langmuir Isotherm, Low Cost, Model, Natural, Natural Zeolite, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Silica, Sources, Strength, Synthesis, Temperature, Thermodynamic, Thermodynamic Parameters, Tuff, Wastewater, Zeolite, Zeolite Y

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Full Text: [2010\Sep Sci Tec45, 1076.pdf](2010/Sep%20Sci%20Tec45,%201076.pdf)

Abstract: In this work, the macroporous anion exchange resin - Amberlite FPA51, is proposed as the effective adsorbent for the removal of Acid Blue 74 from aqueous solutions. The sorption mechanism was investigated under static conditions taking into account the phase contact time, solution pH, initial dye concentration, and temperature. The equilibrium data were fitted to the Langmuir, Freundlich, and Dubinin-Radushkevich isotherm models. The maximum monolayer capacity Q0 was 123.8mg/g. The adsorption kinetics was found to follow the pseudo-second order model. The sorption energy was equal to 14.5kJ/mol and indicated that the adsorption process of the dye may be described via a chemical anion-exchange mechanism.

Keywords: Acid Blue, Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Anion Exchange Resin, Anion Exchanger, Aqueous Solutions, Capacity, Chemical, Concentration, Data, Dye, Energy, Equilibrium, Freundlich, Indigo Carmine Dye, Isotherm, Kinetic, Kinetics, Langmuir, Macroporous, Mechanism, Metal-Ions, Methylene-Blue, Model, Models, Monolayer, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Reactive Dyes, Removal, Resin, Rice Husk, Solution, Solutions, Sorption, Sorption Mechanism, Temperature, Textile Wastewaters, Waste-Water, Work

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Full Text: [2010\Sep Sci Tec45, 1084.pdf](2010/Sep%20Sci%20Tec45,%201084.pdf)

Abstract: The ACs (R-1/2 and R-1/4) having two different textual and chemical properties are prepared from corn-based biomass precursor and evaluated together with a wood-based activated carbon (WAC) at room temperature using a gas chromatograph. The results obtained from the correlation studies indicate that the pore size distribution (below 8 angstrom) and the relatively lower energetic heterogeneity of ACs on acetaldehyde adsorption are considerable factors rather than that of a specific surface area and surface chemistry. The adsorption equilibrium of ACs is well correlated with the Sips equation. The pseudo second-order equation was better in describing the ACs’ adsorption kinetic of acetaldehyde.

Keywords: Acetaldehyde, Activated Carbon, Adsorption, Adsorption Equilibrium, Adsorption Kinetic, Biomass, Carbon, Chemical, Chemistry, Corn Grain, Correlation, Distribution, Equilibrium, Heterogeneity, Kinetic, Kinetics, Pseudo Second Order, Pseudo Second-Order, Pseudo Second-Order Equation, Pseudo-Second-Order, Room Temperature, Second Order, Second-Order, Second-Order Equation, Size, Specific Surface, Specific Surface Area, Surface, Surface Area, Surface Chemistry, Temperature, Water Vapor

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Full Text: [2010\Sep Sci Tec45, 1092.pdf](2010/Sep%20Sci%20Tec45,%201092.pdf)

Abstract: The presence of dyestuffs in wastewater poses an environmental concern since these organic contaminants are toxic to aquatic and non-aquatic life. In addition, these contaminants are difficult to remove or biodegrade, which poses a challenge to the conventional wastewater treatment techniques. In this work, the adsorption of acid red dye 27 (AR27) onto -Fe2O3 nanoadsorbents was studied for the removal of red dye from aqueous solutions by the batch-adsorption technique. The experiments were carried out at different conditions of contact time, initial AR27 concentration, temperature, co-existing ions, and solution pH. It was found that the adsorption was a rapid process, and equilibrium was achieved in less than 4 minutes. The removal of AR27 decreased with the increase in solution pH and temperature. Furthermore, the addition of chloride and nitrate anions has no remarkable influence on AR27 removal efficiency. On the other hand, the effects of sulfate and bicarbonate anions on the removal of AR27 were significant. The adsorption equilibrium data fitted very well using Langmuir and Freundlich adsorption isotherm models. The data obtained from adsorption isotherms at different temperatures were used to calculate thermodynamic quantities of adsorption, such as standard Gibbs free energy change [image omitted], enthalpy change [image omitted], and entropy change [image omitted]. The adsorption process was found to be spontaneous, exothermic and physical in nature. The results indicate that -Fe2O3 nanoadsorbents could be employed for the removal of dyes from wastewater.

Keywords: Activated Carbons, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Isotherms, Anions, Aqueous Solutions, Aqueous-Solutions, Batch Adsorption, Bentonite, Challenge, Chloride, Concentration, Contaminants, Conventional, Cost Effective, Data, Dye, Dyes, Efficiency, Effluents, Energy, Enthalpy, Entropy, Environmental, Equilibrium, Exothermic, Experiments, Freundlich, Freundlich Adsorption Isotherm, Gibbs Free Energy, Ions, Iron Oxide, Isotherm, Isotherms, Kinetics, Langmuir, Life, Low-Cost Adsorbents, Magnetic Nanoparticles, Methylene-Blue, Models, Nanoadsorbent, Nitrate, Organic, pH, Physical, Pore, Red Dye, Removal, Removal Efficiency, Removal of Dyes, Solution, Solutions, Sorption, Standard, Sulfate, Techniques, Temperature, Thermodynamic, Toxic, Treatment, Wastewater, Wastewater Treatment, Work

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Full Text: [2010\Sep Sci Tec45, 1286.pdf](2010/Sep%20Sci%20Tec45,%201286.pdf)

Abstract: The adsorption of cephalexin in aqueous solution has been investigated using bentonite and activated carbon as the adsorbents. Batch kinetics and isotherm studies were carried out to evaluate the effect of contact time, adsorbent dosage, pH, particle size, and temperature. Adsorption equilibrium data were well represented by the Langmuir and Freundlich isotherm models. The adsorption intensity was found to be increased as the aqueous phase pH increased, and had a maximum at pH=6.1. The pseudo-first order, pseudo-second order, and intraparticle diffusion kinetic models were used to describe the kinetic data. The experimental data fitted very well with the pseudo-second-order kinetic model and also followed the simple external and intraparticle model.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Equilibrium, Antibiotics, Aqueous Phase, Aqueous Solution, Bentonite, Biosorption, Carbon, Cephalexin, Cephalosporins, Data, Diffusion, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetic Data, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Liquid Membrane, Methylene-Blue, Model, Models, Particle Size, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Size, Solution, Sorbents, Temperature

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Full Text: [2010\Sep Sci Tec45, 1313.pdf](2010/Sep%20Sci%20Tec45,%201313.pdf)

Abstract: The present investigation aims to remove arsenate [As(V)] by electrochemical coagulation using mild steel as anode and cathode. The results showed that the optimum removal efficiency of 98.6% was achieved at a current density of 0.2Adm-2, at a pH of 7.0. The effect of current density, solution pH, temperature, co-existing ions, adsorption isotherm, and kinetics has been studied. Kinetics reveals that the removal of arsenate by electrochemical coagulation is very rapid in the first 15min and remains almost constant with the progress of reaction. The adsorption kinetics obeys the second-order rate expression. An equilibrium isotherm was measured experimentally and the results were analyzed by Langmuir, Freundlich, Dubinin- Redushkevich, and Frumkin using the linearized correlation co-efficient. The characteristics parameters for each isotherm were determined. The Langmuir adsorption isotherm was found to fit the equilibrium data for arsenate adsorption. Temperature studies showed that the adsorption was endothermic and spontaneous in nature.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solutions, Arsenate, Arsenate Removal, Arsenic(V), Basic Dye, Characteristics, Characterization, Coagulation, Correlation, Correlation Coefficient, Data, Drinking-Water, Efficiency, Electrochemical Coagulation, Electrocoagulation, Endothermic, Equilibrium, Equilibrium Isotherm, Expression, First, Freundlich, Investigation, Ions, Iron, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Oxide, pH, Progress, Removal, Removal Efficiency, Second Order, Second-Order, Solution, Temperature, Waste-Water

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Full Text: [2010\Sep Sci Tec45, 1463.pdf](2010/Sep%20Sci%20Tec45,%201463.pdf)

Abstract: The present study deals with the removal of phosphates from aqueous solution using activated carbon developed from coir pith. Batch adsorption experiments were performed to delineate the effect of initial pH, contact time, adsorbent dose and temperature on the removal of phosphates by coir-pith activated carbon (CAC) (activated by H2SO4). The removal was found to be maximum in the pH range of 6-10. The kinetics of adsorption showed that the phosphate adsorption onto CAC was a gradual process with a quasi-equilibrium being attained in 3h. The adsorption equilibrium data followed the Temkin isotherm. Thermodynamic parameters such as Go, Ho, and So were evaluated by applying the Arrhenius and van’t Hoff equations, and it was found that the adsorption of phosphate on CAC was spontaneous and endothermic.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Coir Pith Activated Carbon, Equilibrium, Fly-Ash, Goethite, Husk Ash RHA, Isotherm, Kinetics, Metal-Ions, Phosphate, Removal, Sorption, Thermodynamic, Thermodynamics

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Full Text: [2010\Sep Sci Tec45, 1490.pdf](2010/Sep%20Sci%20Tec45,%201490.pdf)

Abstract: The adsorption of a cationic dye (rhodamine B, RB) on O-carboximethyl-N-acetylated (L-CMCh) in aqueous solution was investigated. The effect of the process parameters such as the contact time, pH, and temperature are reported. Both temperature and pH influence dye adsorption. To determine the adsorption capacity, the equilibrium adsorption data were analyzed by the Langmuir, Langmuir-Freundlich, and Redlich-Peterson isotherm models. The results showed better agreement with the Langmuir-Freundlich model than the other models. The maximum adsorption capacity of RB for L-CMCh was determined as 38.5mgg-1 at pH 8.5 and 25°C. The kinetic results follow a pseudo-second-order rate equation. The activation energy value for adsorption of RB on L-CMCh was found to be 52.0 kJmol-1. The negative values of Gibbs free energy and enthalpy show the adsorption to be spontaneous and exothermic. The negative value of the enthalpy for adsorption of RB onto L-CMCh shows the adsorption to be exothermic.

Keywords: Activation Energy, Adsorbent, Adsorption, Aqueous-Solution, Batch, Carboxymethylchitosan-N-Acetylated, Chitosan Hydrobeads, Dye, Dye Removal, Equilibrium, Equilibrium Adsorption, Isotherm, Kinetic, Kinetic Adsorption, Kinetics, Langmuir, Malachite Green, Maximum Adsorption Capacity, Reactive Dye, Rhodamine B, Waste Materials, Water

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Full Text: [2010\Sep Sci Tec45, 1963.pdf](2010/Sep%20Sci%20Tec45,%201963.pdf)

Abstract: This study describes the adsorption of heavy metal ions (Cd(II), Cu(II), Ni(II), Pb(II), and Zn(II)) from aqueous solutions by pine (*Pinus densiflora*) sawdust modified with citric acid (CA) or tartaric acid (TA). The optimal parameters, contact time, and pH were determined and the adsorption isotherms were obtained. The removal efficiency of the modified sawdust increased as the pH increased. The maximum adsorption capacity of sawdust modified with CA or TA was 14 to 57 times higher than that of unmodified sawdust. These results indicate that either CA or TA can be used to enhance the removal of heavy metals using sawdust.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solutions, Capacity, Cd(II), Citric Acid, Cr(VI), Cu(II), Efficiency, Electroplating Waste-Water, Equilibrium, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metals, Ions, Isotherms, Metal, Metal Ions, Metals, Modified, Ni(II), Pb(II), pH, Removal, Removal Efficiency, Rice Husk, Sawdust, Solutions, Tartaric Acid, Thermodynamics, Wood Sawdust

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Full Text: [2010\Sep Sci Tec45, 2064.pdf](2010/Sep%20Sci%20Tec45,%202064.pdf)

Abstract: An attempt has been made to synthesize nickel sulphide (NiS) compound by different routes. The NiS material thus obtained was coated on polymethyl metha acrylate (PMMA) beads to form a composite material, which was subjected to its performance evaluation for uptake of 106Ru from low level radioactive liquid waste (LLW) stream. Distribution Coefficient (Kd) of 106Ru from LLW using NiS-PMMA composite beads was found to be in the range of 9000-12000 (ml/g). The effect of various parameters viz. pH, ionic strength, temperature, time equilibration, etc. towards the uptake of 106Ru was investigated. The sorption mechanism was also studied. The G, H, and S value for sorption were evaluated. The sorption was observed to be spontaneous and endothermic in nature. From the practical utilization point of view, the rate of uptake of 106Ru by the composite material was studied. The data of sorption was investigated with Lagergren first-order, pseudo-first-order, and second-order plots. Its intraparticle diffusion mechanism was studied with the Weber Morris model. The kinetics was found to follow a pseudo-first-order pattern with intraparticle diffusion. However, intraparticle diffusion is not the rate controlling step.

Keywords: Adsorption, Aqueous-Solution, Beads, Coated, Complexes, Composite, Data, Diffusion, Endothermic, Equilibration, Evaluation, Exchange Resin, First Order, Intraparticle Diffusion, Ionic Strength, Kinetics, Lagergren, Liquid, Low Level Radioactive Liquid Waste (LLW), Low-Level, Mechanism, Metal-Ions, Model, Nickel, Nickel Sulphide, Nitrosylruthenium, Pattern, Performance, Performance Evaluation, pH, Pmma, Polymeric Material, Polymethyl Metha Acrylate, Pseudo First Order, Pseudo-First-Order, Purex Process, Removal, Ruthenium, Ruthenium, Second Order, Second-Order, Sorption, Sorption Mechanism, Stream, Strength, Temperature, Uptake, Utilization, Value, Waste, Weber Morris

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Full Text: [2010\Sep Sci Tec45, 2076.pdf](2010/Sep%20Sci%20Tec45,%202076.pdf)

Abstract: The potential usage of almond shell (P. dulcis), which is an agricultural waste product, in the removal of malachite green from aqueous solutions was evaluated with respect to various experimental parameters including contact time, initial malachite green concentration, temperature, adsorbent concentration, etc. The adsorption kinetics of malachite green fitted well the pseudo-second-order kinetic model. The monolayer adsorption capacity of almond shell was found to be 29.0mg g-1. The adsorption of malachite green onto almond shell increased with raising the temperature. From the experimental results, almond shell could be employed as a low cost and easily available adsorbent for removal of malachite green in wastewater treatment process.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetics, Agricultural, Agricultural Waste, Almond, Almond Shell, Aqueous Solutions, Aqueous-Solution, Basic-Dyes, Capacity, Concentration, Cost, Equilibrium, Experimental, Industrial Waste-Water, Kinetic, Kinetic Model, Kinetics, Low Cost, Malachite Green, Mechanism, Methylene-Blue, Model, Monolayer, P, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Removal, Solutions, Sorption, Temperature, Thermodynamic, Treatment, Waste, Wastewater, Wastewater Treatment

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Full Text: [2010\Sep Sci Tec45, 2086.pdf](2010/Sep%20Sci%20Tec45,%202086.pdf)

Abstract: Batch adsorption experiments were carried out to remove Hg(II) from aqueous solutions using chitosan-g-poly(acrylic acid)/attapulgite hydrogel composites as adsorbents. The factors influencing the adsorption capacity of the composites were investigated. The results indicate that the adsorption equilibrium of the composites can be achieved within about ten minutes and the equilibrium adsorption capacities of the composites with 10, 30, and 50wt% of attapulgite content were 785.20, 679.63, and 541.06mg g-1, respectively. The negative values of G and positive values of H indicate that the adsorption processes are all spontaneous and endothermic.

Keywords: Activated Palygorskite, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Equilibrium, Aqueous Solutions, Attapulgite, Batch Adsorption, Biosorption, Capacity, Carbons, Chitosan, Clay, Coal, Composite, Composites, Endothermic, Equilibrium, Experiments, Heavy-Metal Ions, Hg(II), Hydrogel, Hydrogel Composite, Mercury(II) Removal, Recovery, Solutions, Thermodynamic Parameter, Waste-Water, Wastewaters

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Full Text: [2010\Sep Sci Tec45, 2104.pdf](2010/Sep%20Sci%20Tec45,%202104.pdf)

Abstract: The sorption behavior of lead ions on coconut coir has been investigated to decontaminate lead ions from aqueous solutions. Various physico-chemical parameters were optimized to simulate the best conditions in which this material can be used as an adsorbent. Maximum adsorption was observed at 0.0001 to 0.001mol L-1 of acid solutions (HNO3, HCl and HClO4) using 0.4g of adsorbent for 4.83×10-5mol L-1 lead concentration in ten minutes equilibration time. The adsorption of lead was decreased with the increase in the concentrations of all the acids used. The kinetic data indicated an intraparticle diffusion process with sorption being pseudo-second order. The determined rate constant k2 was 8.8912g mg-1min-1. The adsorption data obeyed the Freundlich isotherm over the lead concentration range of 2.41×10-4 to 1.45x10-3mol L-1. The characteristic Freundlich constants i.e., 1/n=0.44±0.02 and K=0.184±0.0096m mol g-1 have been computed for the sorption system. The sorption mean free energy from the Dubinin-Radushkevich isotherm is 10.48±0.72kJ mol-1 indicating the ion-exchange mechanism of chemisorption. The uptake of lead increases with the rise in temperature (293-333K). Thermodynamic quantities i.e., G, S, and H have also been calculated for the system. The sorption process was found to be endothermic. The proposed procedure was successfully applied for the removal of lead from battery wastewater samples.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solutions, Aqueous-Solutions, Behavior, Cadmium, Chemisorption, Coconut Coir, Composite, Concentration, Data, Diffusion, Endothermic, Energy, Equilibration, Extraction, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Kinetic, Kinetics, L1, Lead, Lead Adsorption, Mass-Spectrometry, Mechanism, Preconcentration, Procedure, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constant, Removal, Solutions, Sorption, Sorption Isotherms, Sorption Process, Temperature, Thermodynamic, Thermodynamics, Trace-Metals, Uptake, Wastewater

? Ma, J.W., Wang, H., Wang, F.Y. and Huang, Z.H. (2010), Adsorption of 2,4-dichlorophenol from aqueous solution by a new low-cost adsorbent - activated bamboo charcoal. *Separation Science and Technology*, **45** (16), 2329-2336.

Full Text: [2010\Sep Sci Tec45, 2329.pdf](2010/Sep%20Sci%20Tec45,%202329.pdf)

Abstract: Adsorption experiments were conducted to study the removal of 2,4-dichlorophenol (2,4-DCP) from aqueous solution by a new low-cost adsorbent-activated bamboo charcoal. The results showed that acidic pH was favorable for the adsorption and removal of 2,4-DCP. Higher initial 2,4-DCP concentrations led to higher adsorption capacity. Most of the adsorption of 2,4-DCP occurred within the first 5min, and about 90% of 2,4-DCP were removed from solution. After 5min, the adsorption capacity increased slowly with contact time and the adsorption reached equilibrium in less than 100min. As the adsorbent dose was increased, the removal of 2,4-DCP was increased, while the equilibrium time was slightly affected. Adsorption kinetics could be best described by the pseudo-second-order model, independent of adsorbent dosages. The adsorption behavior of 2,4-DCP onto bamboo charcoal fitted both Langmuir and Freundlich isotherms well, but followed Freundlich isotherm more precisely. This study demonstrated for the first time that activated bamboo charcoal could be used for the removal of 2,4-DCP in water treatment.

Keywords: 2,4-Dcp, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetics, Agricultural Waste, Bamboo, Capacity, Carbon, Charcoal, Contact Time, Drinking-Water, Dye Removal, Equilibrium, Fly-Ash, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Model, pH, Phanerochaete-Chrysosporium, Phenolic-Compounds, Pseudo Second Order, Pseudo-Second-Order, Removal, Solid-Waste, Substituted Phenols, Treatment, Water, Water Treatment

? Anirudhan, T.S., Divya, L., Bringle, C.D. and Suchithra, P.S. (2010), Removal of Copper(II) and Zinc(II) from aqueous solutions using a lignocellulosic-based polymeric adsorbent containing amidoxime chelating functional groups. *Separation Science and Technology*, **45** (16), 2383-2393.

Full Text: [2010\Sep Sci Tec45, 2383.pdf](2010/Sep%20Sci%20Tec45,%202383.pdf)

Abstract: In this study, the adsorption of Cu(II) and Zn(II) ions from aqueous solutions onto amidoximated polymerized banana stem (APBS) has been investigated. Infrared spectroscopy was used to confirm graft copolymer formation and amidoxime functionalization. The different variables affecting the sorption capacity such as pH of the solution, adsorption time, initial metal ion concentration, and temperature have been investigated. The optimum pH for maximum adsorption was 10.5 (99.99%) for Zn2+ and 6.0 (99.0%) for Cu2+ at an initial concentration of 10mgL-1. Equilibrium was achieved approximately within 3h. The experimental kinetic data were analyzed using pseudo-first-order and pseudo-second-order kinetic models and are well fitted with pseudo- second-order kinetics. The thermodynamic activation parameters such as Go, Ho, and So were determined to predict the nature of adsorption. The temperature dependence indicates an exothermic process. The experimental isotherm data were well fitted to the Langmuir model with maximum adsorption capacities of 42.32 and 85.89mgg-1 for Cu(II) and Zn(II), respectively, at 20 degrees C. The adsorption efficiency was tested using industrial effluents. Repeated adsorption/regeneration cycles show the feasibility of the APBS for the removal of Cu(II) and Zn(II) ions from water and industrial effluents.

Keywords: Acrylonitrile, Activation, Adsorbent, Adsorption, Adsorption, Amidoxime, Aqueous Solutions, Banana Stem, Banana Stem, Batch Reactor, Capacity, Copper(II), Cu(II), Cu2+, Cycles, Data, Effluents, Equilibrium, Graft Copolymerization, Industrial, Industrial Effluents, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Model, Models, pH, Phosphate, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Second-Order, Sorption, Sorption Capacity, Temperature, Temperature Dependence, Thermodynamic, Wastewaters, Water, Zinc(II), Zn(II), Zn2+

? Jana, S., Purkait, M.K. and Mohanty, K. (2011), Preparation and characterizations of ceramic microfiltration membrane: Effect of inorganic precursors on membrane morphology. *Separation Science and Technology*, **46** (1), 33-45.

Full Text: [2011\Sep Sci Tec46, 33.pdf](2011/Sep%20Sci%20Tec46,%2033.pdf)

Abstract: Ceramic disc type microfiltration membranes (50mm diameter and 5mm thickness) were prepared by the paste method from different compositions of clay, kaolin, and binding agents like sodium carbonate, sodium metasilicate, boric acid, and sintered at different temperatures. All the membranes were characterized by TGA, SEM, XRD, water permeability test, and acid-base treatment. With the increase of sintering temperature, the pore size as well as the permeability and flexural strength were increasing while porosity and pore density were decreasing. It was found that with increasing the amount of kaolin and decreasing the amount of clay the pore diameter was decreasing. A membrane prepared from 18% clay, 62% kaolin, and 20% binding material and sintered at 1000 degrees C has shown the lowest average pore size of 0.31m with porosity, pore density, and flexural strength of 0.22, 4.80x1012m-2 and 12.81MPa respectively. The membrane pore size and pore density were predicted directly from the particle size distribution of the clay and kaolin and were suitably represented by second-order polynomials.

Keywords: Alumina, Binding, Carbonate, Ceramic, Ceramic Membrane, Clay, Distribution, Elaboration, Filtration, Kaolin, Membrane, Microfiltration, Particle Size, Particle Size Distribution, Permeability, Pore Size Prediction, Porosity, Preparation, Second Order, Second-Order, SEM, Sintering, Size, Sodium, Strength, Supports, Temperature, TGA, Treatment, Ultrafiltration Membranes, Water, XRD

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Full Text: [2011\Sep Sci Tec46, 130.pdf](2011/Sep%20Sci%20Tec46,%20130.pdf)

Abstract: A composite adsorbent MIR, manganese and iron (hydr)oxides coated resin, was prepared by coating manganese and iron (hydr)oxides onto the weak basic anion exchange resin D301. The effects of solution pH, contact time, ionic strength, and coexisting ions on arsenate removal with MIR were investigated in batch experiments. The results showed that As(V) can be effectively removed in a wide pH range of 49. The presence of coexisting anions such as [image omitted] had no noticeable effect on arsenate removal efficiency. However, [image omitted] were found to interfere with the arsenate removal significantly. Arsenate adsorption efficiency decreased with the increment of ion strength of the solution. The adsorption isotherm could be well described by the Freundlich model. A pseudo second-order kinetics was able to provide a realistic description of the adsorption kinetics.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aluminum, Anion Exchange Resin, Anions, Arsenate, Arsenate Removal, Arsenic, Arsenic(V) Removal, As(V), Batch, Batch Experiments, Coated, Coating, Composite, Dissolved Carbonate, Efficiency, Experiments, Ferrihydrite, Freundlich, Freundlich Model, Groundwater, Ion Strength, Ionic Strength, Ions, Iron, Iron (Hydr)Oxides, Isotherm, Kinetics, Manganese, Manganese (Hydr)Oxides, Model, Ph, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Removal, Removal Efficiency, Resin, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Sorption, Strength, Surface Speciation, Water Interface

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Full Text: [2011\Sep Sci Tec46, 155.pdf](2011/Sep%20Sci%20Tec46,%20155.pdf)

Abstract: Adsorbents prepared from pistachio nut shell, an agricultural waste biomass, were successfully used to remove Acid Violet 17 from an aqueous solution. The activated carbons PNS1, PNS2, and PNS3 were characterized by scanning electron microscope (SEM), Fourier Transform - Infra Red spectroscopy (FTIR) and (BET). The effect of pH, adsorbent dosage, and temperature on dye removal was studied. Maximum color removal was observed at pH 2. The adsorption increased with the increase in adsorbent dosage. As the adsorption capacity increased with the increase in temperature, the process was concluded to be endothermic. The experimental data were analyzed by the Langmuir and Freundlich isotherm models of adsorption. Equilibrium data fitted well with the Langmuir model. The rates of adsorption confirmed the pseudo-second order kinetics with good correlation values. The results indicated that the activated carbon prepared from pistachio nut shell can be effectively used for the removal of Acid Violet 17 from aqueous solution.

Keywords: Acid Violet 17, Activated Carbon, Activated Carbons, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Agricultural, Agricultural Waste, Aqueous Solution, Bet, Biomass, Capacity, Carbon, Color Removal, Correlation, Data, Dye, Dye Removal, Effluent, Endothermic, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Ftir, Isotherm, Isotherms, Kinetics, Kinetics, Langmuir, Langmuir Model, Model, Models, pH, Pistachio Nut Shell, Pith, Products, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Rates, Removal, SEM, Solution, Sorption, Spectroscopy, Temperature, Waste, Waste Biomass, Waters

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Full Text: [2011\Sep Sci Tec46, 172.pdf](2011/Sep%20Sci%20Tec46,%20172.pdf)

Abstract: In this article, we report the mechanism and kinetics of adsorption of uranyl ions on starch-based functional hydrogels. The hydrogels were prepared from starch in native or hydrolyzed/oxidized form by crosslinking with N,N-methylenebisacrylamide. The hydrogels synthesized from the oxidized starch have carboxylic groups at C-6 position. The effect of the structure and external environmental factors, i.e., contact time, temperature, ion strength, and simulated seawater (0.55M NaCl and 3mM NaHCO3), was investigated on the uranyl adsorption behavior of hydrogels. The adsorption of uranyl ions was rapid as the highest adsorption was observed after 6h and at 40ºC. The sorbents also exhibited appreciable ion uptake even from the simulated seawater. The equilibrium data was analyzed using Langmuir and Freundlich adsorption isotherms and pseudo-first order and pseudo-second order kinetic models. Evidence of adsorption was obtained by characterization of the uranyl ions-loaded hydrogels by FTIR spectroscopy and also by elution with 0.1N HCl.

Keywords: Acid Hydrogels, Acrylamide, Adsorption, Adsorption Behavior, Adsorption Isotherms, Aqueous-Solutions, Behavior, Carboxylic, Cellulose, Characterization, Crosslinking, Data, Elution, Environmental, Equilibrium, Freundlich, FTIR, FTIR Spectroscopy, Functional Starch, Graft-Copolymers, Heavy-Metals, Hydrogels, Ion Strength, Ions, Isotherms, Kinetic, Kinetic Models, Kinetics, Kinetics of Adsorption, Langmuir, Mechanism, Models, NaCl, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First Order and Pseudo-Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Recovery, Removal, Seawater, Separation, Simulated Seawater, Sorbents, Spectroscopy, Starch, Strength, Structure, Temperature, Uptake, Uranium, Uranyl Ions

? Liu, Y., Li, H., Tan, G.Q. and Zhu, X.H. (2011), Fe2+-modified vermiculite for the removal of chromium(VI) from aqueous solution. *Separation Science and Technology*, **46** (2), 290-299.

Full Text: [2011\Sep Sci Tec46, 290.pdf](2011/Sep%20Sci%20Tec46,%20290.pdf)

Abstract: A novel adsorbent: Fe2+-modified vermiculite was prepared in a two-step reaction. Adsorption experiments were carried out as a function of pH, contact time, and concentration of Cr(VI). It was found that Fe2+-modified vermiculite was particularly effective for the removal of Cr(VI) at pH 1.0. The adsorption of Cr(VI) reached equilibrium within 60min, and the pseudo-second-order kinetic model best described the adsorption kinetics. The adsorption data follow the Langmuir model more than the Freundlich model. At pH 1.0, the maximum Cr(VI) sorption capacity (Qmax) was 87.72mg center dot g-1. Desorption of Cr(VI) from Fe2+-modified vermiculite using NaOH treatment exhibited a higher desorption efficiency by more than 80%. The sorption mechanisms including electrostatic interaction and reduction were involved in the Cr (VI) removal. The results showed that Fe2+-modified vermiculite can be used as a new adsorbent for Cr(VI) removal which has a higher adsorption capacity and a faster adsorption rate.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Rate, Biosorption, Capacity, Chromium, Concentration, Cr(VI) Anion, Cr(VI), Cr(VI) Sorption, Data, Desorption, Efficiency, Equilibrium, Experiments, Fe2+-Modified Vermiculite, Freundlich, Freundlich Model, Function, Interaction, Ions, Iron, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Mechanism, Mechanism, Mechanisms, Model, NaOH, NaOH Treatment, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reduction, Removal, Sorption, Sorption Capacity, Sorption Mechanisms, Treatment, Vermiculite, Waste

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Full Text: [2011\Sep Sci Tec46, 300.pdf](2011/Sep%20Sci%20Tec46,%20300.pdf)

Abstract: The potential use of different activated carbons (ACs) prepared from dates pits and phosphoric acid for the removal of phenol from aqueous solutions was investigated. Date pits were converted into five different types of activated carbons by air and phosphoric acid activation. The specific surface area (BET) of the prepared ACs varied from 794 m2/g, for the phosphoric acid: date pit ratio of 5:1, to 1707 m2/g for a ratio of 2:1. Batch adsorption experiments revealed that the adsorption of phenol varied among all of the prepared ACs, where the 2:1 AC showed the highest uptake. Equilibrium pH studies showed that the phenol removal was pH dependent and the maximum phenol uptake occurred at an equilibrium pH of 3.0. Dynamics studies indicated that the initial uptake of phenol on 2:1 AC at pH 4 was rapid, where 80% of the maximum uptake was achieved during the first 30 minutes, both surface adsorption and intraparticle diffusion were involved in the adsorption process and the data followed the pseudo second-order reaction. The equilibrium adsorption data of phenol on 2:1 AC at solution pH 3 was best described by the Redlich-Peterson, Sips, and Langmuir models.

Keywords: Acid Activation, Acid-Activation, Activated Carbon, Activated Carbons, Activation, Adsorption, Air, Aqueous Solutions, Aqueous-Solutions, Batch Adsorption, BET, Data, Diffusion, Equilibrium, Experiments, Extraction, First, Intraparticle Diffusion, Isotherm, Isotherm, Kinetics, Langmuir, Models, pH, pH-Dependent, Phenol, Phenol Removal, Phosphoric Acid, Porosity, Potential, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Reactor, Redlich-Peterson, Removal, Second Order, Second-Order, Sips, Solution, Solutions, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Uptake, Water

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Full Text: [2011\Sep Sci Tec46, 330.pdf](2011/Sep%20Sci%20Tec46,%20330.pdf)

Abstract: Introduction of xanthate group onto sugarcane (*Saccharum officinarum*) bagasse has been investigated for the removal of cadmium, lead, nickel, zinc, and copper from their aqueous media. The charred xanthated sugarcane bagasse (CXSB) was found to have significant adsorption capacity which is more than that of various bio-sorbents mentioned in the available literatures. The newly developed bio-sorbent was characterized by SEM, FTIR, TGA/DTA, and elemental analysis. The velocity of sorption of the tested metals was fast, reaching equilibrium within 40min. The maximum loading capacities was found to be 225 for Cd(II), 318 for Pb(II), 144 for Ni(II), 164 for Zn(II), and 178 for Cu(II) mg g-1, respectively. The fast kinetics results and high adsorption capacity indicated that CXSB can be applied as the selective adsorbent for the treatment of heavy metal ions from aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Analysis, Aqueous Solutions, Bagasse, Biosorbent, Biosorbents, Biosorption, Cadmium, Capacity, Cd(II), Cd2+, Characterization, Charred Sugarcane Bagasse, Copper, Cu(II), Equilibrium, FTIR, Heavy Metal, Heavy Metal Ions, Heavy Metals, Ions, Isotherm, Kinetics, Lead, Loading, Media, Metal, Metal Ions, Metals, Ni(II), Nickel, Pb(II), Preparation, Removal, SEM, Separation, Solutions, Sorption, Succinic Anhydride, Sugarcane, Treatment, Waste-Water, Wastewaters, Xanthation, Zinc, Zn(II)

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Full Text: [2011\Sep Sci Tec46, 452.pdf](2011/Sep%20Sci%20Tec46,%20452.pdf)

Abstract: In this study, pyromellitic dianhydride (PMDA) modified waste sugarcane bagasse (SCB) was prepared through a simple method to remove two cationic dyes: methylene blue (MB) and malachite green (MG) from aqueous solution. Adsorption performances of MB and MG on the modified sorbent were investigated in details. The adsorption capacities of the modified SCB for MB and MG were 571.4 and 377.4mgg-1, respectively, which were 10 and 12 times than that obtained on the unmodified SCB. Adsorption kinetics study showed equilibriums were obtained after adsorption for 13 hours for both dyes. The modified SCB could be used repeatedly after regeneration. FTIR results showed that carboxyl and hydroxyl groups on the modified SCB involved in adsorption process.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Basic Dye, Dyes, Equilibrium Isotherm Analyses, Fly-Ash, Ftir, Kinetics, Malachite Green, Malachite Green Removal, Methylene Blue, Methylene-Blue, Modified, Modified Biomass, Oil Palm Shell, Pyromellitic Dianhydride, Regeneration, Sawdust Adsorption, Sorption, Sugarcane, Sugarcane Bagasse, Waste-Water

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Full Text: [2011\Sep Sci Tec46, 460.pdf](2011/Sep%20Sci%20Tec46,%20460.pdf)

Abstract: This laboratory study investigates the performances of coconut shell waste-based activated carbon (CSBAC) in removing 4-chlorophenol (4-CP) from contaminated water. To improve its removal for target compound, the surface of CSBAC was modified with TiO2, NaOH, and/or HNO3. Under optimized conditions at the same initial concentration of 25mg/L, the NaOH-treated CSBAC could remove 91% of 4-CP, compared to the HNO3-oxidized CSBAC (60%) or the TiO2-coated CSBAC (72%). Although the NaOH-treated CSBAC could remove 91% of 4-CP, the adsorption treatment using this adsorbent alone was unable to meet the effluent limit of lower than 1mg/L. Therefore, subsequent biological processes are required to complement the removal of 4-CP from wastewater.

Keywords: 4-Chlorophenol, Activated Carbon, Adsorbent, Adsorption, Advanced Oxidation Processes, Agricultural Waste, Aqueous-Solutions, Biological, Carbon, Coconut Shell, Concentration, Ethylenediaminetetraacetic Acid, GAC Adsorption Treatment, Heavy-Metals, Hydrogen-Peroxide, Landfill Leachate, Light-Emitting-Diodes, Low-Cost Adsorbents, Modified, NaOH, Physico-Chemical Treatments, Recalcitrant Compounds, Removal, Salicylic-Acid, Surface, Surface Modification, TiO2, Treatment, Wastewater, Water, Water Pollution Control

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Full Text: [2011\Sep Sci Tec46, 656.pdf](2011/Sep%20Sci%20Tec46,%20656.pdf)

Abstract: The effects of contact time, reaction temperature, and ionic strength on crystal violet adsorption onto Cu(II)-loaded montmorillonite were studied. The kinetic experimental data were analyzed using pseudo-first-order, pseudo-second-order, and Elovich equations to examine the adsorption mechanism. The result suggested that the adsorption was best represented by the pseudo-second-order equation. The suitability of the Langmuir, Freundich, and Temkin isotherms to equilibrium data was also investigated at 25ºC. The maximum adsorption capacity was 114.3mg dye/g Cu(II)-loaded montmorillonite at adsorbent concentration 1g/L. The differential heat of adsorption was evaluated and the result showed that adsorption of crystal violet onto the Cu-loaded sample was chemical in nature. The ionic strength and reaction temperature exhibited an insignificant impact on the crystal violet adsorption. The Cu(II)-loaded montmorillonite could serve as low-cost adsorbents for removing crystal violet from aqueous solution compared to the data reported in the literature.

Keywords: Adsorption, Bentonite, Biosorbents, Chitosan, Crystal Violet, Cu(II)-Loaded Montmorillonite, Dye, Equilibrium, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Mechanism, Metal-Ions, Models, Montmorillonite, Removal, Sorption, Wastewater Treatment

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Full Text: [2011\Sep Sci Tec46, 825.pdf](2011/Sep%20Sci%20Tec46,%20825.pdf)

Abstract: Tamarind (*Tamarindus indica L*.) seed kernel polysaccharide-silica (TKP-Si) nanohybrids have been fabricated in a base catalyzed sol-gel reaction where tetraethylorthosilicate (TEOS) and tamarind kernel polysaccharide were used as silica precursor and template respectively. The nanohybrids were found to be photoluminescent and efficient in Hg(II) removal from the synthetic aqueous solution. The synthesized nanohybrids were characterized using Fourier Transform Infra-red spectroscopy (FTIR), X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Thermogravimetric Analysis (TGA), Differential Thermal Analysis (DTA), and Photoluminescence (PL) analysis. For obtaining the most efficient sample in terms of mercury (II) binding, various ratios of reactants (Polysaccharide: TEOS: H2O: EtOH) were used and the optimum sample thus obtained was calcined at 200ºC (in air) to further enhance its binding performance. A mechanism for the sorption of Hg(II) by the optimum hybrid sample (TH1) has been proposed and to understand its sorption behavior, kinetics and isotherm studies have also been performed. Regeneration studies indicated that the loaded Hg(II) from the used hybrid can be easily desorbed and can be successfully reused for eight consecutive adsorption-desorption cycles.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Aqueous-Solutions, FTIR, Hg(II) Adsoption, Isotherm, Kinetics, Mechanism, Mercury, Modified Guar Gum, Nanocomposites, Nanohybrid, Photoluminescence, Regeneration, Removal, Sol-Gel, Sol-Gel Method, Sorbent, Sorption, Tamarind Polysaccharide, TEOS, Waste-Water

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Full Text: [2011\Sep Sci Tec46, 858.pdf](2011/Sep%20Sci%20Tec46,%20858.pdf)

Abstract: A series of carboxymethyl cellulose-g-poly (acrylic acid)/attapulgite hydrogel composites were synthesized for the removal of cationic dye methylene blue. Various factors affecting the uptake behavior were investigated. Adsorption rate of the hydrogel was quite fast, and adsorption equilibrium could be reached within 30min. Adsorption kinetics well followed the pseudo-second-order equation for all systems. The Langmuir isotherm was found to best represent the data for the dye uptake. Even when 20wt% attapulgite was introduced into the hydrogel, the corresponding maximum adsorption capacity reached 1979.48 mg/g at 30ºC. The as-prepared adsorbents exhibited excellent affinity for the dye, and can be applied to treat wastewater containing basic dyes.

Keywords: Adsorption, Adsorption Kinetics, Attapulgite, Basic-Dyes, Carboxymethyl Cellulose, Cellulose, Chitosan, Clay Nanocomposite, Composite, Composites, Diffusion, Dye, Dyes, Equilibrium, Fly-Ash, Hydrogel, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Removal, Sorption, Wastewater

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Full Text: [2011\Sep Sci Tec46, 997.pdf](2011/Sep%20Sci%20Tec46,%20997.pdf)

Abstract: Equilibrium, thermodynamic, and kinetic studies on the biosorption of Cu(II) using biomass, Trichoderma viride were carried out. The biosorbent was characterized by Fourier transform infrared spectroscopy and Scanning Electron Microscopy. The Langmuir and Freundlich isotherm models were applied to describe the biosorption process. The influence of pH, the biomass dosage, the contact time, the initial metal ion concentration, and the temperature of the solution on the biosorption was studied. The maximum Cu(II) biosorption was attained at pH 5. The equilibrium data were better fit by the Langmuir isotherm model than by the Freundlich isotherm. The maximum biosorption capacity of T. viride biomass was found to be 19.6mg/g for Cu(II). The kinetic studies indicated that the biosorption of Cu(II) followed the pseudo-second-order model. The calculated thermodynamic parameters, Gibbs-free energy (Go), enthalpy (Ho), and entropy (So) showed that the biosorption of Cu(II) onto T. viride biomass was spontaneous and endothermic. It can be concluded that the T. viride biomass has the potential as an effective and low-cost biosorbent for Cu(II) removal from aqueous solutions.

Keywords: Adsorption, Aqueous-Solution, *Aspergillus-niger*, Biosorbent, Biosorption, Biosorption, Cadmium, Copper, Copper, Cu(II), Equilibrium, Freundlich, Freundlich Isotherm, Green Coconut Shell, Heavy-Metals, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Pb(II), pH, Removal, Rhizopus-Arrhizus, Thermodynamic, Thermodynamic Parameters, Trichoderma Viride

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Full Text: [2011\Sep Sci Tec46, 1005.pdf](2011/Sep%20Sci%20Tec46,%201005.pdf)

Abstract: Arsenic contamination in drinking water resources is a global problem, therefore, its removal from drinking water has become an important sustainable matter. The adsorption process can be more cost-effective and applicable, especially, if the absorbents used in the process are low-cost natural geo-materials. Beidellite, zeolite, and sepiolite are inexpensive and natural minerals available locally, modified, and used as adsorbents for the removal of arsenic ions from aqueous solutions in batch experiments. The kinetics of the adsorption process was separately tested for the pseudo-first order and pseudo-second order reactions and intra-particle diffusion models. The rate constants of adsorption for all these kinetic models were calculated. The comparison among the models showed that the pseudo second-order model best described the adsorption kinetics. Applied to the experimental equilibrium, at different temperatures were the Langmuir and Freundlich isotherm models. The Langmuir isotherm was used to calculate the adsorption capacities (Qº) of minerals for arsenic ions. The adsorption capacities of these three modified minerals, at different temperatures, ranged from 476 to 841 mu g/g. Thermodynamic studies showed that the arsenic uptake reactions by minerals were endothermic and spontaneous in nature. Bottled spring water containing arsenic, sold in markets, was used to conduct the arsenic adsorption study beidellite, zeolite, and sepiolite, minerals which efficiently removed the arsenate ions from the bottled drinking water. The use of modified beidellite, zeolite, and sepiolite as adsorbents in the arsenic ion removal processes is possible, based on the optimum parameters found.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, and Isotherms, Aqueous-Solutions, Arsenic, Beidellite, Clays, Clinoptilolite, Equation, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Laterite, Lead, Removal, Sepiolite, Sorption, Sulfate, Thermodynamic, Thermodynamics, Water, Zeolite

? Goswami, R., Deb, P., Thakur, R., Sarma, K.P. and Basumallick, A. (2011), Removal of As(III) from aqueous solution using functionalized ultrafine iron oxide nanoparticles. *Separation Science and Technology*, **46** (6), 1017-1022.

Full Text: [2011\Sep Sci Tec46, 1017.pdf](2011/Sep%20Sci%20Tec46,%201017.pdf)

Abstract: Arsenic toxicity has become a major concern worldwide. Remediation of this problem needs the development of technology with improved materials and systems with high efficiency. We have demonstrated a simple and efficient method for the absolute removal of As(III) from high concentration As(III) treated water with a low contact time period. The process of As(III) adsorption follows pseudo-second-order kinetic model. The mechanism for high-adsorption efficiency is attributed to fatty acid binding domain-mediated surface conjugation of ultrafine Fe2O3 nanoparticles with As(III). We have also ensured the simultaneous separation of arsenic sorbed nanoparticles by entrapping them in hydrophilic calcium alginate beads and thereby a pure arsenic free solution has been obtained.

Keywords: Adsorption, Alginate, Arsenic, Arsenic Removal, As(III), As(V), Entrapment, Groundwater, Kinetic, Kinetic Model, Maghemite, Mechanism, Remediation, Removal, Separation, Toxicity

? Bulgariu, L., Bulgariu, D. and Macoveanu, M. (2011), Adsorptive performances of alkaline treated peat for heavy metal removal. *Separation Science and Technology*, **46** (6), 1023-1033.

Full Text: [2011\Sep Sci Tec46, 1023.pdf](2011/Sep%20Sci%20Tec46,%201023.pdf)

Abstract: The adsorptive performances of alkaline treated peat have been investigated for the removal of Pb(II), Co(II), and Ni(II) ions from aqueous solutions. The influence of initial metal ions concentration and equilibrium contact time was studied in a series of batch experiments, in comparison with natural peat. An increasing of adsorption capacity of alkaline treated peat was obtained for all studied heavy metals (23.07% - Pb(II), 23.53% - Co(II), and 26.19% - Ni(II)). The Langmuir isotherm model was the best model for the mathematical description of studied heavy metals adsorption on alkaline treated peat. A significant decrease of equilibrium contact time in case of alkaline treated peat was also found. The kinetics of Pb(II), Co(II), and Ni(II) uptake by alkaline treated peat followed the pseudo-second order mechanism. The FT-IR spectrometry analysis showed that carboxylic (-COO-) and hydroxyl (-OH) groups play an important role in the heavy metals binding process. The heavy metal could by easily eluted from the loaded adsorbent with 0.1mol/L HCl and the adsorbent may be reused in several adsorption/desorption cycles. The alkaline treated peat has better adsorption characteristics for the removal of heavy metals from aqueous solutions, and the cost of this treatment is very low.

Keywords: Adsorption, Alkaline Treated Peat, Aqueous-Solutions, Biosorbents, Co(II), Copper, Equilibrium, Equilibrium Isotherm, FT-IR, FTIR, Heavy Metals, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Mechanism, Ni(II), Ni(II) Ions, Pb(II), Removal, Sorbents, Sorption, Sphagnum Moss Peat, Wastewaters

? Khan, M.A., Lee, S.H., Kang, S., Paeng, K.J., Lee, G., Oh, S.E. and Jeon, B.H. (2011), Adsorption studies for the removal of methyl tert-butyl ether on various commercially available GACs from an aqueous medium. *Separation Science and Technology*, **46** (7), 1121-1130.

Full Text: [2011\Sep Sci Tec46, 1121.pdf](2011/Sep%20Sci%20Tec46,%201121.pdf)

Abstract: This study highlights the potential of four commercially available granular-activated carbons (GACs) to remove Methyl tert-butyl ether (MTBE) from an aqueous medium. Thermodynamics and kinetics parameters were elucidated. The FT-IR spectra showed decrease in peak intensity after the adsorption. The decline in the peak intensity revealed that the adsorption occurred on available active sites over the surface of the GACs. The adsorption on GACs was maximum in the pH range 7-8, with maximum adsorption capacity (47.82mg/g, pH 8) observed with CGAC. The contact time studies showed optimum adsorption of MTBE on CGAC (67.05mg/g) at 300mg/L initial MTBE concentration. The applicability of the Freundlich model illustrates a multilayer adsorption process. The adsorption process is endothermic in nature. The kinetics studies showed that the adsorption follows the pseudo-second-order model on GACs and the intraparticle diffusion is the rate-controlling mechanism on CGAC.

Keywords: Activated Carbons, Adsorption, Basic Dye, Biodegradation, Degradation, Drinking-Water, Freundlich, FT-IR, FTIR, Granular Activated Carbons, Ions, Kinetics, Kinetics, Mechanism, Methyl Tert-Butyl Ether, MTBE, pH, Physisorption, Removal, Sorption, Thermodynamics, Thermodynamics

? Martínez-Miranda, V., García-Sánchez, J.J. and Solache-Ríos, M. (2011), Fluoride ions behavior in the presence of corrosion products of iron: Effects of other anions. *Separation Science and Technology*, **46** (9), 1443-1449.

Full Text: [2011\Sep Sci Tec46, 1443.pdf](2011/Sep%20Sci%20Tec46,%201443.pdf)

Abstract: The behavior of fluoride ions in the presence of corrosion products of iron in drinking and water solutions was analyzed and the adsorption capacities of the iron oxides (corrosion products of iron) for fluoride ions were determined. Drinking water containing naturally 2.45mg of fluoride ions per liter was characterized and the concentrations of other anions were determined. The effect of contact time, the initial concentration of fluoride ions, and the effect of other anions naturally present in the drinking water were considered. The kinetic results could be adjusted to the pseudo-second order model, which indicated that the sorption mechanism was chemisorption and the equilibrium was reached in 24 hours. The presence of bicarbonate and chloride ions diminishes the removal efficiency of the fluoride ions, whereas other anions (sulfate, phosphate, and nitrate) did not show any significant effect. The results reflect that the iron oxides products from the corrosion of a hydraulic infrastructure allow the removal of fluoride ions from water.

Keywords: Adsorption, Aqueous-Solutions, Corrosion, Drinking Water, Drinking-Water, Fluoride, Hydrotalcite-Like Compounds, Ions, Iron, Kinetics, Magnesium, Model, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sorption, Sorption, Systems, Waste

? Suteu, D., Bilba, D., Doroftei, F. and Malutan, T. (2011), Sorption of Brilliant Red HE-3B reactive dye from aqueous solution onto seashells waste: equilibrium and kinetic studies. *Separation Science and Technology*, **46** (9), 1462-1471.

Full Text: [2011\Sep Sci Tec46, 1462.pdf](2011/Sep%20Sci%20Tec46,%201462.pdf)

Abstract: The potential of waste seashells powder, as a new adsorbent for Brilliant Red HE-3B reactive dye removal from aqueous solutions, was examined by the batch technique. The Freundlich, Langmuir, and Dubinin-Radushkevich adsorption models were applied to describe the equilibrium sorption data and to determine the corresponding isotherm constants. The values of the thermodynamic parameters, G, H, and S, indicate that the sorption of reactive dye is a spontaneous and endothermic process. The kinetic data evaluated by pseudo-first order, pseudo-second order, and intraparticle diffusion kinetic models suggested that the sorption of reactive dye onto seashell is a complex process and both surface sorption and intraparticle diffusion contributes to the rate limiting step.

Keywords: Adsorbent, Adsorption, Arsenate, Brilliant Red He-3b Dye, Calcite, Decolorization, Diffusion, Equilibrium, Equilibrium And Kinetic Studies, Isotherm, Kinetic, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Dye, Removal, Seashells Waste Powder, Shells, Sorption, Thermodynamic Parameters

? Zahoor, M. and Mahramanlioglu, M. (2011), Removal of phenolic substances from water by adsorption and adsorption-ultrafiltration. *Separation Science and Technology*, **46** (9), 1482-1494.

Full Text: [2011\Sep Sci Tec46, 1482.pdf](2011/Sep%20Sci%20Tec46,%201482.pdf)

Abstract: In this work a magnetic adsorbent, magnetic activated carbon (MAC) was prepared and characterized by powdered X-Ray diffraction (XRD). A comparison was made between powdered activated carbon (PAC) and MAC for foul control in ultrafiltration (UF) membrane processes. First, the adsorptive parameters for PAC and MAC were determined for phenol, chlorophenol, nitrophenol, and hydroquinone. Equilibrium data fitted well to the Langmuir model in the studied concentration range of the adsorbates. Adsorption kinetics followed a pseudo second-order kinetic model rather than pseudo first-order kinetic model. These adsorbents were then used in combination with UF membrane. The parameters like percent rejection and flow rate for the hybrid UF, PAC and UF, MAC were determined. The influences of both adsorbents on flow rates and percent rejections were almost equal. The problems associated with PAC in the UF processes like cake formation and blackening of the pipes were not observed for MAC. MAC was removed from the slurry after use through a magnetic process.

Keywords: Activated Carbon, Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous-Solution, Equilibrium, Humic Substances, Isotherms, Kinetics, Magnetic Activated Carbon, Membrane Filtration Process, Model, Model Application, Molecular-Weight, Natural Organic-Matter, PAC-UF Systems, Performance, Pretreatment, Pseudo-First-Order, Pseudo-Second-Order, Ultrafiltration

# Title: Separations Technology

Full Journal Title: [Separations Technology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6177&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=c8f95e62b6ca9be73dc80990f8262776)

ISO Abbreviated Title:

JCR Abbreviated Title: Separ Technol

ISSN: 0956-9618

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Batabyal, D., Sahu, A. and Chaudhuri, S.K. (1995), Kinetics and mechanism of removal of 2,4-dimethyl phenol from aqueous solutions with coal fly ash. *Separations Technology*, **5** (4), 179-186.

Full Text: [S\Sep Tec5, 179.pdf](S/Sep%20Tec5,%20179.pdf)

Abstract: Coal fly ash, a solid waste from thermal power stations was used to successfully remove 2,4-dimethyl phenol by adsorption from aqueous solutions. The rate of adsorption follows first order kinetics before attaining equilibrium. Both diffusional and kinetic resistances affect the rate of adsorption and their relative effects vary with operating temperatures. Equilibrium adsorption data satisfied both Langmuir and Freundlich isotherms.

Keywords: Fly Ash, 2,4-dimethyl Phenol, Diffusion and Kinetics Resistances, Physical Adsorption, Equilibrium Isotherms

Lim, B.G., Ching, C.B. and Tan, R.B.H. (1996), Determination of competitive adsorption isotherms of enantiomers on a dual-site adsorbent. *Separations Technology*, **5** (4), 213-228.

Full Text: [S\Sep Tec5, 213.pdf](S/Sep%20Tec5,%20213.pdf)

Abstract: The competitive adsorption isotherms of praziquantel enantiomers on microcrystalline cellulose triacetate were determined by concentration pulse chromatography. A model comprising a non-selective linear term and a selective first order improved Langmuir term was found to fit the data excellently. It is postulated that this chiral stationary phase consists of two types of binding sites: one responsible for the chiral, selective interactions and one responsible for the achiral, non-selective interactions of the enantiomers with the stationary phase. The selective sites are easily saturated compared to the non-selective sites, accounting for the experimental observation of lower separation efficiency at higher enantiomer concentrations.

Keywords: Praziquantel, Adsorption Isotherm, Microcrystalline Cellulose Triacetate, Concentration Pulse Chromatography

Liang, L.Y., Gu, B.H. and Yin, X.P. (1996), Removal of technetium-99 from contaminated groundwater with sorbents and reductive materials. *Separations Technology*, **6** (2), 111-122.

Full Text: [S\Sep Tec6, 111.pdf](S/Sep%20Tec6,%20111.pdf)

Abstract: Pertechnetate oxyanion (TcO4-), which is highly soluble in water and readily mobile in the environment, can be immobilized through an ion exchange/adsorption process and chemical reduction followed by adsorption and/or precipitation. Previous studies have focused on the separation and removal of 99TcO4- from high-level waste streams, however, little information is available for 99TcO4- removal from only slightly contaminated groundwater. This paper describes treatment of 99TcO4- contaminated groundwater with both batch and column flowthrough experiments. Synthetic resins and sponges, and zero-valence iron filings were used to evaluate their capacities and the rates of 99TcO4- removal. The toxicity characteristic leaching procedure (TCLP) was applied to evaluate the leachability of 99Tc adsorbed or co-precipitated on iron. Results suggest that both iron and synthetic resins remove 99TcO4- from groundwater and that at a high flow rate (with residence time of less than 1 min), 99TcO4- removal capacity is greater for iron filings than for the synthetic resins on a volume basis. Additionally, the rate of (TcO4-)-Tc-99 sorption on the sponge is slow (approximately 3 days), and the capacity is relatively low. No appreciable amount of 99Tc can be leached out from the spent iron filings by the TCLP test. Overall, zero-valence iron filings provide fast reaction and high removal capacity for 99TcO4- in groundwater. The high removal efficiency, low cost, and the small waste production of zero-valence iron are attractive for remediation of 99TcO4- contaminated groundwater.

Keywords: Technetium, Synthetic Resins, Zero-Valence Iron, Reductive Precipitation, 99Tc, Chemistry, Sorption

Chen, J.P., Yiacoumi, S. and Blaydes, T.G. (1996), Equilibrium and kinetic studies of copper adsorption by activated carbon. *Separations Technology*, **6** (2), 133-146.

Full Text: [S\Sep Tec6, 133.pdf](S/Sep%20Tec6,%20133.pdf)

Abstract: Copper adsorption by granular activated carbon is reported in this paper. The experimental section includes titrations of activated carbon, as well as equilibrium and kinetic studies of copper adsorption. The potentiometric titration results show that the point of zero charge is 9.5, and that the surface charge increases with decreasing pH. The adsorption of copper strongly depends on solution pH and increases from 10 to 95% at pH ranging from 2.3 to 8. A dramatic increase in pH and emission of small gas bubbles are observed during the experiments, which may result from adsorption of hydrogen ion and/or reduction-oxidation reactions. The two-pK triple-layer model is employed to describe copper adsorption. KINEQL, an adsorption kinetics algorithm, is used to represent the experimental data, and it is found that the model can describe reasonably well the experimental measurements of surface charge, adsorption equilibrium, and adsorption kinetics. Calculations show that formation of the surface-metal complexes SO-Cu2+ and SO-CuOH+ (a hydrolysis product of SO-Cu2+) in the outer layer around the surface of carbon results in removal of copper ion. It is also found that mass transfer controls the adsorption rate, and that adsorption occurs in the micropore region where both external mass transfer and diffusion are important.

Keywords: Granular Activated Carbon, Copper Adsorption, Two-Pk Triple-Layer Model, Kineql, Adsorption Equilibrium, Adsorption Kinetics, Oxide-Water Interface, Surface-Ionization, Complexation, Sorption, Model

# Title: Serials Librarian

Full Journal Title: [Serials Librarian](http://www.informaworld.com/smpp/title~db=all~content=t792306962~tab=issueslist)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0361-526X

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gilreath, C.L. (1978), Agricola - multipurpose data-base for agricultural and life sciences libraries. *Serials Librarian*, **3** (1), 89-95.

Full Text: [1960-80\Ser Lib3, 89.pdf](1960-80/Ser%20Lib3,%2089.pdf)

Abstract: AGRICOLA (Agricultural Online Access), the bibliographic data base of the National Agricultural Library, is a computerized information retrieual system that can be adapted for use in many library functions. Although the system is most commonly used for retrieval of bibliographic references by subject, it can also be helpful in preorder and precataloging searches, in interlibrary loan verification, and in collection analysis. Various bibliometric studies that can be done with the on-line versions of AGRICOLA are described as well.

? Rashid, H.F. (1991), Bibliometric analysis as a tool in journal evaluation. *Serials Librarian*, **20** (2-3), 55-64.

Full Text: [1991\Ser Lib20, 55.pdf](1991/Ser%20Lib20,%2055.pdf)

Abstract: A new formula for establishing the relationship between the number of papers (n) published in a journal of physics, chemistry or biology and the rank (R) of the journal concerned is proposed. The new formula is straightforward and simple, and appears to lead to a reasonably accurate prediction of the number of published source items in a journal, provided the rank of the journal is known. The proposed formula may be considered as a modification of or alternative to Bradford’s law.

Keywords: Bibliometric, Bibliometric Analysis, Bradford, Evaluation, Lotka Law

? Narin, F. (1991), Globalization of research, scholarly information, and patents: 10 year trends. *Serials Librarian*, **21** (2-3), 33-44.

Full Text: [1991\Ser Lib21, 33.pdf](1991/Ser%20Lib21,%2033.pdf)

? Van Hooydonk, G. (1995), Cost and citation data for 5399 scientific journals in connection with journal price-setting, copyright laws and the use of bibliometric data for project review. *Serials Librarian*, **27** (1), 45-58.

Full Text: [1995\Ser Lib27, 45.pdf](1995/Ser%20Lib27,%2045.pdf)

Abstract: Bibliotheconomic (cost) and bibliometric (citation) data have been coupled for 5399 journals in the Journal Citation Reports (Science Citation Index) of 1990, after rearranging and averaging them for 12 major and classical scientific disciplines, Trends ate discussed in connection with peer review of scientific projects using impact data, with anomalous price-settings for journals and with effects of copyright laws on scientific research. Coupling journal cost with citation data reveals opposite trends for disciplines and publishers

Keywords: Bibliometric, Citation, Cost, Data, Effects, Impact, Impact Factors, Journal, Journal Citation Reports, Journals, Laws, Peer, Peer Review, Peer-Review, Project Review, Research, Review, Science Citation Index, Scientific Journals, Scientific Research, Trends

? Loughner, W. (1996), Scientific journal usage in a large university library: A local citation analysis. *Serials Librarian*, **29** (3-4), 79-88.

Full Text: [1996\Ser Lib29, 79.pdf](1996/Ser%20Lib29,%2079.pdf)

Abstract: Citation analysis is a helpful tool for evaluating academic library usage. When only the publications of local users are analyzed, the results are even more relevant to the local library Manual collection of citations can be a time- and labor-intensive operation and has inhibited widespread use of local citation analysis. This study demonstrates how to use the Science Citation Index CDROM product and a personal computer to generate useful reports utilizing a much larger base of citations than previously has been possible. Moreover, the process is so relatively quick and easy that it can be run annually or whenever needed. In the study, over 35,000 citations from papers by scientific researchers at the University of Georgia were analyzed to generate reports useful for collection development.

? Hérubel, J.P.V.M. and Goedeken, E.A. (2000), Metadisciplinarity, Belles lettres, and André Malraux: A bibliometric exploration of knowledge formation. *Serials Librarian*, **37** (4), 51-68.

Full Text: [2000\Ser Lib37, 51.pdf](2000/Ser%20Lib37,%2051.pdf)

Abstract: A theoretical and conceptual mapping of the contours of knowledge emerges through a bibliometric approach using the Arts and Humanities Citation Index. Focusing on Andre Malraux and his writings, one can discern how bibliometrics can effectively explore the subtle characteristics of disciplinary knowledge, and how their permutations reflect the evolution of knowledge along a metadisciplinary continuum. Evidence indicates that Malraux’s non-disciplinary, i.e., belles-lettres, writing has influenced theoretical thinking in a number of disciplines. Malraux’s intellectual and cultural influence can be effectively pursued through referential analysis. This theoretical approach provides a viable conceptual model of intellectual mutation, influence, and bibliometric veracity. This study’s results show that this methodology could be applied effectively in other areas of intellectual history and cultural studies.

Keywords: Bibliometric Analysis, Andre Malraux, Metadisciplinarity, Interdisciplinarity, Citation Characteristics, Fine-Arts, Monographs, Science, Work

? Hérubel, J.P.V.M. and Goedeken, E.A. (2001), Using the *Arts and Humanities Citation Index* to identify a community of interdisciplinary historians: An exploratory bibliometric study. *Serials Librarian*, **41** (1), 85-98.

Full Text: [S\Ser Lib41, 85.pdf](S/Ser%20Lib41,%2085.pdf)

Abstract: The history journal Annales: Economies, Soci’t’s, civilizations is investigated for 1980-1989 to reveal an institutional and geographical mapping of the Annales contributors. Using the Arts and Humanities Citation Index database, the author’s institutional affiliations are identified and examined with the intention of verifying a community of Annaliste historians publishing research within the parameters of Annaliste historiography and intellectual concerns. A discussion of domains of knowledge and disciplinarities is linked to intellectual orientation. This study indicates that these historians are predominately French with a significant minority representing an international community. Substantive knowledge of Annaliste historical research, methodologies, and intellectual orientation animates institutional affiliation. Finally, the authors suggest that identifying any major ‘school’ of historiographical innovation can be accomplished through use of bibliometrical analysis

Keywords: Affiliation, Analysis, Annalistes, Arts and Humanities Citation Index, Authors, Bibliometric, Bibliometric Analysis, Bibliometric Study, Citation, Community, Database, French, History, Innovation, Institutional, Intention, Interdisciplinarity, Interdisciplinary, International, Journal, Knowledge, Mapping, Methodologies, Minority, Orientation, Publishing, Research

? Nisonger, T.E. (2004), The benefits and drawbacks of impact factor for journal collection management in libraries. *Serials Librarian*, **47** (1-2), 57-75.

Full Text: [2004\Ser Lib47, 57.pdf](2004/Ser%20Lib47,%2057.pdf)

Abstract: An overview and analysis of the Journal Citation Reports’ impact factor is provided here. The historical development, calculation of, and alternatives to impact factor are briefly described. Nine general uses of impact factor, including library collection management decisions, journal rankings, journal decision models, and full-text database evaluation, are discussed. Ten benefits, such as its well-established authority, are listed. Finally, more than a dozen criticisms of citation data in general (e.g., self-citations are counted) and impact factor specifically (e.g., problems with the formula for its calculation) are analyzed. The author concludes that impact factor, if used appropriately and in combination with other criteria, is a valid tool that can assist journal collection management decisions in research libraries.

Keywords: Analysis, Author, Citation, Citation Analysis, Citation Analysis, Deselection, Evaluation, Genetics, Impact Factor, Index, Information-Science, Journal, Journal Citation Reports, Journal Collection Management, Journal Evaluation, Periodicals, Publications, Rankings, Reports, Research, Research Evaluation, Self Citations, Self-Citations, Social-Science, Stature

# Title: Serials Review

Full Journal Title: [Serials Review](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=00987913)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0098-7913

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Anderson, P. (1997), ‘Gatekeepers’ and the quality of the journal literature: Findings from a survey of journal editors into the issue of alleged excessive publication in scholarly and scientific journals. *Serials Review*, **23** (2), 45-57.

Full Text: [1997\Ser Rev23, 45.pdf](1997/Ser%20Rev23,%2045.pdf)

Abstract: The findings discussed here are not an exhaustive rendition of all the factors—professional, academic and ethical—surrounding the issue of excessive publication. Instead, they outline a problem of current and growing concern within the professional serials librarian community and are intended to equip serials librarians to deal more effectively with the phenomenon.

The occasionally divergent characteristics of excessive publication in the sciences and the social sciences, although only briefly touched upon here, provide an initial indication of what serials librarians and subject specialists should look for in attempting to assess the quality of the journal literature in different disciplines.

It may be true that some journal editors regard serials librarians as superfluous to the ‘gatekeeper’ function—a point sadly confirmed by these findings. Such a situation indicates a clear need on the part of the serials librarian community to take a more proactive role in asserting their responsibilities in this area. Many serials librarians will complain that their libraries are a captive audience, that they have little scope to contribute to the debate on excessive publication, and even less to influence directly the quality control role of journal editors and publishers, that they are *victims*.

Chapman and Webster typify the views of many observers when they explicitly single out journal publishers as exploiters of academic libraries: ‘… *it is libraries, pressed by their academic colleagues, which provide the bulk of the circulation for journals and assured profit for the publisher. They are charged exorbitant rates on the grounds that they are read by many people. But can we continue in this way? Are libraries’ stacks to bulge with unread journals*?.

These are important questions which require longterm strategic consideration. What is clear is that the problem of excessive publication is one of many closely inter-linked issues which influence collection evaluation approaches. It is incumbent upon the academic and research library community to base collection management decisions on a thorough consideration of the qualitative aspects of collection development, through a more informed understanding of the issue of journal and article quality.

The findings reported here can best be utilized as only one part of an intelligent, planned collection management process. Recommendations from academic and research staff, evidence from user studies, bibliometric analyses, and subscription costs are all important factors in assessing the value of scholarly and scientific journals—but none should be regarded in isolation.

Edwards S. (1999), Citation analysis as a collection development tool: A bibliometric study of polymer science theses and dissertations. *Serials Review*, **25** (1), 11-20.

Full Text: [1999\Ser Rev25, 11.pdf](1999/Ser%20Rev25,%2011.pdf)

Testa, J. (2003), The Thomson ISI journal selection process. *Serials Review*, **29** (3), 210-212.

Full Text: [2003\Ser Rev25, 210.pdf](2003/Ser%20Rev25,%20210.pdf)

Abstract: For more than four decades, Thomson ISI (Institute for Scientific Information) has been committed to a fundamental mission: to provide essential products and services that enable access to and management of the highest quality, most relevant materials for all participants in the research process. In 1958, Dr. Eugene Garfield started ISI by borrowing five hundred dollars from Household Finance. *Current Contents*® *of Chemical, Phamaco-Medical & Life Sciences* was the sole product, covering 286 journals. Today the Thomson ISI database covers more than 16,000 international journals, books, and proceedings in the sciences, social sciences, and arts and humanities. This article describes the processes and standards that result in ISI’s abstracting and indexing services. Serials Review 2003, 29:210–212.

? Park, T.K. (2008), Asian and pacific region authorship characteristics in leading library and information science journals. *Serials Review*, **34** (4), 243-251.

Full Text: 2008\Scr Mat34, 243.pdf

Abstract: Authorship characteristics from the Asian and Pacific region In the top twenty journals in library and information science are studied. Data was collected searching the Institute for Scientific Information (ISI) Web of Science databases. Major findings of this study are: there are a total of 1,317 articles for the period 1.967 to 2005; the most productive countries are, in rank order, Australia, China, South Korea, Taiwan, Singapore, Japan, New Zealand, Malaysia, Thailand and Philippines; and 77.6 percent of authors in the top twenty library and information science Journals contributed a single article. Among the library science journals about 50 percent were written by multiple authors, while 73.1 percent of articles in the information science journals were written collaboratively. The most productive individual authors in the region are reported. The strongest collaboration within the region took place between Australia and China; China and Singapore; Australia and New Zealand. Serials Review 2008; 34:243-251. (C) 2008 Elsevier Inc. All rights reserved.

Keywords: Authors, Authorship, China, Collaboration, College, Databases, Information, Information Science, ISI, Japan, Journals, Library and Information Science, Library Science, Malaysia, New Zealand, Review, Scholarly Productivity, Science, Scientific Information, Serials, South Korea, US LIS Faculty, Web of Science

? Deng, P.S.H., Yang, G.K.L. and Lin, J.S.J. (2006), Note on correction factor for estimating the diameter of embedded cylindrical fibres from metallographic sections. *Scripta Materialia*, **55** (4), 419-420.

Full Text: [2006\Scr Mat55, 419.pdf](2006/Scr%20Mat55,%20419.pdf)

Abstract: This article recalculates the correction factor for estimating the diameter of aligned cylindrical fibres from random metallographic sections as put forward in the paper of Lewis and Withers [Acta Metall. Mater. 43 (1995) 3685]. Their assertion may contain typographic and arithmetic errors (leading to an error of a factor of 2). The diameter must be estimated from longitudinal metallographic sections where the fibre diameters are partially embedded and therefore cannot be measured directly. In view of the high level of citations of the original paper, it is important to address this problem accurately and completely to ensure the successful application of their suggested method by others. The purpose of this short note is to correct their results.

Keywords: Correction Factor, Cylinder Diameter

? Wang, M.Y., Zhou, Z.X., Fang, H.L. and Liu, X.L. (2011), The bibliometric characteristics of Chinese medical core journals. *Serials Review*, **37** (1), 9-13.

Full Text: [2011\Ser Rev37, 9.pdf](2011/Ser%20Rev37,%209.pdf)

Abstract: To provide bibliometric evidence for Chinese medical journals to be considered for the evaluation system of core journals, the authors have undertaken a comparative study on bibliometric characteristics between Chinese core journals and common journals (journals not included in A Guide to the Core Journals of China). There are 203 Chinese medical core journals and 440 Chinese common journals. Impact factor, ratio of articles supported with funding sources (foundation), total yearly pages and average article length of core journals are significantly higher than those of common journals in China. Medical editors can take effective measures to improve academic levels and journal impact by considering factors from this study, such as having a proper and short publication cycle, increasing the impact factor, concentrating on articles with foundation support, publishing more high-impact papers, increasing substantive content and publishing more articles with abstracts. Serials Review 2011, 37:9-13. (C) 2010 Published by Elsevier Inc.

Keywords: Authors, Bibliometric, Characteristics, China, Chinese, Comparative Study, Evaluation, Evidence, Funding, Impact, Impact Factor, Journal, Journal Impact, Journals, Length, Mar, Medical, Medical Journals, Papers, Publication, Publishing, Sources, Support

# Title: Series-Journal of the Spanish Economic Association

Full Journal Title: Series-Journal of the Spanish Economic Association

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ruiz-Castillo, J. (2012), The evaluation of citation distributions. *Series-Journal of the Spanish Economic Association*, **3** (1-2), 291-310.

Full Text: [2012\Ser-J Spa Eco Ass3, 291.pdf](2012/Ser-J%20Spa%20Eco%20Ass3,%20291.pdf)

Abstract: This paper reviews a number of recent contributions that demonstrate that a blend of welfare economics and statistical analysis is useful in the evaluation of the citations received by scientific papers in the periodical literature. The paper begins by clarifying the role of citation analysis in the evaluation of research. Next, a summary of results about the citation distributions’ basic features at different aggregation levels is offered. These results indicate that citation distributions share the same broad shape, are highly skewed, and are often crowned by a power law. In light of this evidence, a novel methodology for the evaluation of research units is illustrated by comparing the high- and low-citation impact achieved by the US, the European Union, and the rest of the world in 22 scientific fields. However, contrary to recent claims, it is shown that mean normalization at the sub-field level does not lead to a universal distribution. Nevertheless, among other topics subject to ongoing research, it appears that this lack of universality does not preclude sensible normalization procedures to compare the citation impact of articles in different scientific fields.

Keywords: Analysis, Articles, Bibliometric Tools, Citation, Citation Analysis, Citation Impact, Citations, Consequences, Economics, European Paradox, Evaluation, Excellence, Impact, Index, Law, Lead, Literature, Methodology, National Research Performance, Papers, Periodical, Poverty, Poverty Measurement, Power, Power Law, Ranking Scientific Institutions, Research, Research Performance, Science System, Statistical, Topics, US

# Title: Sewage and Industrial Wastes

Full Journal Title: [Sewage and Industrial Wastes](http://www.jstor.org.ludwig.lub.lu.se/action/showPublication?journalCode=sewaworkj) (1928-1949, Vols. 1-31)

Full Journal Title: [Journal of the Water Pollution Control Federation](http://www.jstor.org.ludwig.lub.lu.se/action/showPublication?journalCode=jwatpollcontfed) (1960-1989, Vols. 32-61)

Full Journal Title: [Research Journal of the Water Pollution Control Federation](http://www.jstor.org.ludwig.lub.lu.se/action/showPublication?journalCode=rjwatpollcontfed) (1989-1991, Vols. 61-63)

Full Journal Title: [Water Environment Research](http://www.jstor.org.ludwig.lub.lu.se/action/showPublication?journalCode=wateenvirese) (1992-2002, Vols. 64-74)

Full Journal Title: [Sewage and Industrial Wastes](http://www.jstor.org.ludwig.lub.lu.se/action/showPublication?journalCode=sewainduwast)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0096-364X

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ullrich, A.H. and Smith, M.W. (1951), The biosorption process of sewage and waste treatment. *Sewage and Industrial Wastes*, **23** (10), 1248-1253.

Full Text: [-1959\Sew Ind Was23, 1248.pdf](-1959/Sew%20Ind%20Was23,%201248.pdf)

? Haseltine, T.R. (1952), Activated sludge plant operation. *Sewage and Industrial Wastes*, **24** (12), 1533-1537.

Full Text: [-1959\Sew Ind Was24, 1537.pdf](-1959/Sew%20Ind%20Was24,%201537.pdf)

Notes: KKinetic

? Weston, R.F. and Eckenfelder, W.W. (1955), Application of biological treatment to industrial wastes: I. Kinetics and equilibria of oxidative treatment. *Sewage and Industrial Wastes*, **27** (7), 802-820.

Full Text: [-1959\Sew Ind Was27, 802.pdf](-1959/Sew%20Ind%20Was27,%20802.pdf)

? Ullrich, A.H. and Smith, M.W. (1957), Operation experience with activated sludge: Biosorption at Austin, Texas. *Sewage and Industrial Wastes*, **29** (4), 400-413.

Full Text: [-1959\Sew Ind Was29, 400.pdf](-1959/Sew%20Ind%20Was29,%20400.pdf)

? Souther, R.H. and Alspaugh, T.A. (1957), Textile wastes: Recovery and treatment. *Sewage and Industrial Wastes*, **29** (8), 918-935.

Full Text: [-1959\Sew Ind Was29, 918.pdf](-1959/Sew%20Ind%20Was29,%20918.pdf)

# Title: Sewage Treatment in Hot Climates

John Wiley and Sons, Chichester, New York, Brisbane and Toronto

Mara, D. (1978), *Sewage Treatment in Hot Climates*, John Wiley and Sons, Chichester, New York, Brisbane and Toronto.

# Title: Sewage Works Journal

Title: Sewage Work Journal (Vol. 1-20)

Title: Sewage and Industrial Wastes (Vol. 21-)

Full Journal Title: Sewage Works Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fales, A.L. (1948), A plating waste disposal problem. *Sewage Works Journal*, **20** (5), 857-860.

Full Text: [-1959\Sew Wor J20, 857.pdf](-1959/Sew%20Wor%20J20,%20857.pdf)

# Title: Sexual Health

Full Journal Title: Sexual Health

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Thompson, S.C., Green, S.K., Stirling, E.J. and James, R. (2007), An analysis of reporting of sexually transmissible infections in indigenous Australians in mainstream Australian newspapers. *Sexual Health*, **4** (1), 9-16.

Abstract: Background: To investigate the nature of, and trends in, Australian print media coverage of sexually transmissible infections (STI) in indigenous Australians. Methods: Newspaper articles from January 1986 to June 2004 were downloaded from the Factiva database. Of 164 articles examined based on our search criteria, 100 were included for analysis. An assessment of the tone and content of each article was made by two reviewers, and data were entered and analysed using EpiInfo (Centers for Disease Control and Prevention, Atlanta, GA) Results: Most articles were serious (89%), matter of fact and information dense (50%) and critical of the subject of the article (44%). Of the articles that were emotive, 78% evoked a sense of shock or frustration. The stimulus for the article was government related in 65%, a purely academic opinion was presented in 82%, and only one viewpoint was presented in 73%. The papers publishing the greatest number of articles were The Sydney Morning Herald (31%) and The Age (18%). From 1996 there was an increase in the number of articles and improvements in the voice given to indigenous informants. This may reflect initiatives in journalism education and release of a protocol on how STI in indigenous communities should be reported. Conclusion: Overall, the style of reporting was heavy, dry and critical, written in an academic style and failed to critically examine or challenge government initiatives. The potential for print media to educate the general public is poorly utilised. Further exploration of how sensitive indigenous issues can be presented to avoid stereotyping, stigma and nihilism, while initiating more effective action, is needed.

Keywords: Analysis, Assessment, Australian, Challenge, Coverage, Criteria, Data, Database, Education, General, Infections, Informants, Information, Journalism, Media, Papers, Potential, Public, Publishing, Release, Reporting, Shock, Stigma, Sydney, Tone, Trends

# Title: Sexually Transmitted Infections

Full Journal Title: Sexually Transmitted Infections

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yee, L.J. and Rhodes, S.D. (2002), Understanding correlates of hepatitis B virus vaccination in men who have sex with men: What have we learned? *Sexually Transmitted Infections*, **78** (5), 374-377.

Abstract: Objectives: Hepatitis B infection (HBV) is prevalent among men who have sex with men (MSM) and may lead to significant morbidity and death. Although an effective vaccine exists vaccination rates among MSM are low. We conducted a systematic review to synthesise the various findings from empirical correlational studies to understand HBV vaccination and series completion among MSM. Methods: We systematically searched the MEDLINE, PUBMED, EMBASE, CINAHL, ERIC, and Web of Science databases to identify the breadth of published studies pertaining to HBV vaccination among MSM and to synthesise findings from these studies to better identify common themes that may direct future research and intervention approaches. Results: Eight papers specifically addressed correlates of HBV vaccination among MSM. Six domains were identified as predictors of vaccination: (1) demographic variables such as younger age and higher education level; (2) knowledge of the vaccine; (3) access to health care, (4) level of “outness” regarding one’s same sex sexual orientation; (5) behavioural factors including sexual and drug use behaviour,- and (6) psychosocial variables. Three papers addressed predictors of vaccine series completion among MSM, observing two main domains: (1) demographic variables such as younger age and higher income level; and, (2) behavioural factors including sexual and health promotion behaviours. Conclusions: Continued educational efforts, creation of environments that facilitate proper risk factor evaluation, and access to low cost vaccine may facilitate vaccine uptake. Although we observed important trends in the studies we reviewed, there is a lack of empirical research regarding this important public health issue.

Keywords: Awareness, Community-Health-Center, Correlates, Databases, Drug, Drug Use, Education, Embase, Evaluation, Hbv, Health Care, Health Promotion, Hepatitis, Higher Education, Homosexual Men, Immunization, Income, Infection, Intervention, Knowledge, Lead, Men, Methods, Morbidity, National-Health, Nutrition Examination Surveys, Papers, Population, Promotion, Psychosocial, Public Health, Pubmed, Research, Review, Risk, Risk Factor, Science, Systematic, Systematic Review, Trends, United-States, Vaccination, Vaccination Rates, Vaccine, Web of Science, Young Men

? Degenhardt, L., Hall, W. and Warner-Smith, M. (2006), Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. *Sexually Transmitted Infections*, **82**, 56-63.

Abstract: Background: Injecting drug use (IDU) and associated mortality appear to be increasing in many parts of the world. IDU is an important factor in HIV transmission. In estimating AIDS mortality attributable to IDU, it is important to take account of premature mortality rates from other causes to ensure that AIDS related mortality among injecting drug users (IDUs) is not overestimated. The current review provides estimates of the excess non-AIDS mortality among IDUs. Method: Searches were conducted with MEDLINE, PsycINFO, and the Web of Science. The authors also searched reference lists of identified papers and an earlier literature review by English et al (1995). Crude. mortality rates (CMRs) were derived from data on the number of deaths, period of follow UP, and number of participants. In estimating the all-cause mortality, two rates were calculated: one that included all cohort studies identified in the search, and one that only included studies that reported on AIDS deaths in their cohort. This provided lower and upper mortality rates, respectively. Results: The current paper derived weighted mortality rates based upon cohort studies that included 179 885 participants, 1 219 422 person-years of observation, and 16 593 deaths. The weighted crude AIDS mortality rate from studies that reported AIDS deaths was approximately 0.78% per annum. The median estimated non-AIDS mortality rate was 1.08% per annum. Conclusions: Illicit drug users have a greatly increased risk of premature death and mortality due to AIDS forms a significant part of that increased risk; it is, however, only part of that risk. Future work needs to examine mortality rates among IDUs in developing countries, and collect data on the relation between HIV and increased mortality due to all causes among this group.

Keywords: AID, AIDS, Authors, Cohort Studies, Developing Countries, Drug, Drug Use, HIV, Literature, Literature Review, Mortality, Observation, Papers, Review, Risk, Science, Web of Science

? Degenhardt, L., Hall, W. and Warner-Smith, M. (2006), Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. *Sexually Transmitted Infections*, **82**, III56-III63.

Abstract: Background: Injecting drug use (IDU) and associated mortality appear to be increasing in many parts of the world. IDU is an important factor in HIV transmission. In estimating AIDS mortality attributable to IDU, it is important to take account of premature mortality rates from other causes to ensure that AIDS related mortality among injecting drug users (IDUs) is not overestimated. The current review provides estimates of the excess non-AIDS mortality among IDUs. Method: Searches were conducted with MEDLINE, PsycINFO, and the Web of Science. The authors also searched reference lists of identified papers and an earlier literature review by English et al (1995). Crude mortality rates (CMRs) were derived from data on the number of deaths, period of follow up, and number of participants. In estimating the all-cause mortality, two rates were calculated: one that included all cohort studies identified in the search, and one that only included studies that reported on AIDS deaths in their cohort. This provided lower and upper mortality rates, respectively. Results: The current paper derived weighted mortality rates based upon cohort studies that included 179 885 participants, 1 219 422 person-years of observation, and 16 593 deaths. The weighted crude AIDS mortality rate from studies that reported AIDS deaths was approximately 0.78% per annum. The median estimated non-AIDS mortality rate was 1.08% per annum. Conclusions: Illicit drug users have a greatly increased risk of premature death and mortality due to AIDS forms a significant part of that increased risk; it is, however, only part of that risk. Future work needs to examine mortality rates among IDUs in developing countries, and collect data on the relation between HIV and increased mortality due to all causes among this group.

Keywords: 22-Year Follow-Up, Active Antiretroviral Therapy, Aid, Aids, Authors, Cocaine Use, Cohort Studies, Developing Countries, Drug, Drug Use, Follow-up, Hepatitis-C-Virus, Heroin-Addicts, HIV, Hiv-Infection, Human-Immunodeficiency-Virus, Literature, Literature Review, Methadone-Maintenance, Mortality, Observation, Papers, Regular Amphetamine Users, Review, Risk, Science, Serious Suicide Attempts, Web of Science

? Lorenc, T., Marrero-Guillamon, I., Aggleton, P., Cooper, C., Llewellyn, A., Lehmann, A. and Lindsay, C. (2011), Promoting the uptake of HIV testing among men who have sex with men: systematic review of effectiveness and cost-effectiveness. *Sexually Transmitted Infections*, **87** (4), 272-278.

Abstract: What interventions are effective and cost-effective in increasing the uptake of HIV testing among men who have sex with men (MSM)? A systematic review was conducted of the following databases: AEGIS, ASSIA, BL Direct, BNI, Centre for Reviews and Dissemination, Cochrane Database of Systematic Reviews, CINAHL, Current Contents Connect, EconLit, EMBASE, ERIC, HMIC, MEDLINE, MEDLINE In-Process, NRR, PsychINFO, Scopus, SIGLE, Social Policy and Practice, Web of Science, websites, journal hand-searching, citation chasing and expert recommendations. Prospective studies of the effectiveness or cost-effectiveness of interventions (randomised controlled trial (RCT), controlled trial, one-group or any economic analysis) were included if the intervention aimed to increase the uptake of HIV testing among MSM in a high-income (Organization for Economic Co-operation and Development) country. Quality was assessed and data were extracted using standardised tools. Results were synthesised narratively. Twelve effectiveness studies and one cost-effectiveness study were located, covering a range of intervention types. There is evidence that rapid testing and counselling in community settings (one RCT), and intensive peer counselling (one RCT), can increase the uptake of HIV testing among MSM. There are promising results regarding the introduction of opt-out testing in sexually transmitted infection clinics (two one-group studies). Findings regarding other interventions, including bundling HIV tests with other tests, peer outreach in community settings, and media campaigns, are inconclusive. Findings indicate several promising approaches to increasing HIV testing among MSM. However, there is limited evidence overall, and evidence for the effectiveness of key intervention types (particularly peer outreach and media campaigns) remains lacking.

Keywords: Analysis, Behavior, Campaigns, Citation, Cochrane, Cost-Effectiveness, Database, Databases, Effectiveness, Embase, Gay Men, Guidelines, HIV, Infection, Intervention, Interventions, Journal, Men, Policy, Practice, Prospective Studies, Quality, Randomised Controlled Trial, Review, Risk, Science, Scopus, Settings, Strategies, Systematic, Systematic Review, Web of Science, Websites

# Title: Sheng Wu Yi Xue Gong Cheng Xue Za Zhi

Full Journal Title: Sheng Wu Yi Xue Gong Cheng Xue Za Zhi

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhao, P., Xu, P., Li, B. and Wang, Z. (2005), Scientometrics and bibliometrics of chronotherapy. *Sheng Wu Yi Xue Gong Cheng Xue Za Zhi*, **22** (1), 120-124.

Abstract: In order to retrieve Chinese and foreign articles of chronotherapy, we searched Chinese databases of CBM, CMCC and foreign series databases in OVID and hence revealed and assessed the current status, research trend and level of chronotherapy in China and in foreign countries by means of scientometric and bibliometric parameters. ProCite5 software and handsearching were used to manage, check and statistically analyze the searched papers so as to find the parameters which included distributions of databases, years, authors, periodicals, subject headings, organizations and nations. 91 Chinese papers were identified which were distributed in 73 kinds of journals and in subject headings, e.g., Traditional Chinese medicine, cardiovascular diseases, neoplasms, asthma, peptic ulcer, diabetes mellitus, general review of chronotherapy, etc. 480 foreign articles were identified which mainly came from EMBASE and MEDLINE and were distributed in 285 types of journals and 35 nations and regions. There were 14 journals which recorded five or more articles. 12 researchers published more than five articles. Paul Brousse Hospital, University of Texas, University of Connecticut School of Medicine, Jichi Medical School and University of Minnesota were the core research institutes. There was no core author or core journal or core institute in China up till now. However, core authors, core journals and core research institutes had come into being in foreign countries, they were mainly from the Euro-American developed countries and had done well in chronotherapy.

Keywords: Asthma, Bibliometric, Bibliometrics, Cardiovascular, China, Chinese, Connecticut, Databases, Diabetes, Diabetes Mellitus, Diseases, Distributed, General, Journal, Journals, Medicine, Medline, Nations, Neoplasms, Papers, Periodicals, Research, Research Trend, Review, Scientometric, Software, Texas, Till, Trend

? Zhao, P., Xu, P., Li, B. and Wang, Z. (2003), Scientometrics and bibliometrics of biomedical engineering periodicals and papers. *Sheng Wu Yi Xue Gong Cheng Xue Za Zhi*, **20** (3), 515-520.

Abstract: This investigation was made to reveal the current status, research trend and research level of biomedical engineering in Chinese mainland by means of scientometrics and to assess the quality of the four domestic publications by bibliometrics. We identified all articles of four related publications by searching Chinese and foreign databases from 1997 to 2001. All articles collected or cited by these databases were searched and statistically analyzed for finding out the relevant distributions, including databases, years, authors, institutions, subject headings and subheadings. The source of sustentation funds and the related articles were analyzed too. The results showed that two journals were cited by two foreign databases and five Chinese databases simultaneously. The output of Journal of Biomedical Engineering was the highest. Its quantity of original papers cited by EI, CA and the totality of papers sponsored by funds were higher than those of the others, but the quantity and percentage per year of biomedical articles cited by EI were decreased in all. Inland core authors and institutions had come into being in the field of biomedical engineering. Their research topics were mainly concentrated on ten subject headings which included biocompatible materials, computer-assisted signal processing, electrocardiography, computer-assisted image processing, biomechanics, algorithms, electroencephalography, automatic data processing, mechanical stress, hemodynamics, mathematical computing, microcomputers, theoretical models, etc. The main subheadings were concentrated on instrumentation, physiopathology, diagnosis, therapy, ultrasonography, physiology, analysis, surgery, pathology, method, etc.

Keywords: Algorithms, Analysis, Automatic Data Processing, Bibliometrics, Biocompatible, Biomechanics, Biomedical, Chinese, Data, Databases, Diagnosis, Engineering, Field, Hemodynamics, Image Processing, Institutions, Instrumentation, Investigation, Journals, Mathematical Computing, Models, Papers, Pathology, Periodicals, Physiology, Publications, Quality, Quality of, Research, Research Trend, Scientometrics, Source, Stress, Surgery, Theoretical Models, Therapy, Trend, Ultrasonography

# Title: Shanghai Kou Qiang Yi Xue

Full Journal Title: Shanghai Kou Qiang Yi Xue

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wang, Y.H. and Zhang, F.Q. (2007), Analysis of Chinese literatures on evidence-based dentistry between 2001 and 2006. *Shanghai Kou Qiang Yi Xue*, **16** (5), 534-537.

Full Text: [2007\Sha Kou Qia Yi Xue16, 534.pdf](2007/Sha%20Kou%20Qia%20Yi%20Xue16,%20534.pdf)

Abstract: PURPOSE: To explore the research trends and statuses of evidence-based dentistry. METHODS: Analyzing the articles related with EBD from 2001-2006 by bibliometrics, which were CNKI database. RESULTS: 74 articles were found out from the database. The number of articles was increasing. The study was mainly on oral mucosa and oral and maxillofacial surgery and so on. Those important journals on domestic evidence-based dentistry are Chinese Journal of Evidence-Based Medicine, Chinese Journal of Stomatology, China Journal of Oral and Maxillofacial Surgery. CONCLUSION: Many articles are introductions to evidence-based dentistry repeatedly, their innovations are weak and depress of their study is superficial. Supported by Shanghai Leading Academic Discipline Project (Grant No.T0202).

Keywords: Bibliometrics, China, Chinese, Database, Dentistry, Evidence Based, Evidence-Based, Journals, Methods, Oral, Purpose, Research, Surgery, Trends

# Title: Shengwu Duoyangxing

Full Journal Title: [Shengwu Duoyangxing](http://www.biodiversity-science.net/CN/article/showTenYearOldVolumn.do)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chen, J., Zhang, B., Ma, K. and Jiang, Z. (2009), Bibliometric analysis of status quo of conservation biology in China. *Shengwu Duoyangxing*, **17** (4), 423-429.

Full Text: [2009\She Duo17, 423.pdf](2009/She%20Duo17,%20423.pdf)

Abstract: The research in conservation biology started in 1990 and is currently in a stage of rapid development in China. To understand the status quo of conservation biology in China, we used the term “conservation biology” as the keyword to search and collect Chinese and English literatures in conservation biology which were written by Chinese researchers in ISI Web of Knowledge and Chinese Journals Full-Text Database. These publications were analyzed with methods of bibliometrics, on the distribution of the publication year, the author and organization distribution, the journal distribution, the research funds, the research regions and the objects. The results indicate that core research groups working in the field of conservation biology in China have been already formed, although the distribution of research groups was scattered over institutions and universities. Dispersion and concentration coexisted in the journal distribution of Chinese and English publications - a majority of publications was clumped in a small number of journals, while a minority was scattered in a large number of journals. In China, there is only one professional journal publishing papers on conservation biology[long dash]Biodiversity Science. Thus it is reasonable to launch an English conservation biology journal in the country. Research funds for conservation biology have a wide array of sources. An important part of the papers in Chinese was supported by the National Natural Science Foundation of China and provincial foundations, while those in English were supported either by National Natural Science Foundation of China or international funds. Field studies in conservation biology were mainly conducted in the regions of high biodiversities in south and southwest China. Plants, mammals and birds were the main objects of those studies. In the studies on single species, 90% were studies on endangered species. Studies on bio-inventory and genetic diversity represented a significant proportion of publications, while little was published about the strategies and practices of conservation.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometrics, Biology, Birds, China, Chinese, Concentration, Conservation, Conservation Biology, Country, Development, Distribution, Diversity, Endangered Species, Field, Genetic, Genetic Diversity, Institutions, International, ISI, Journal, Journals, Mammals, Methods, Organization, Papers, Practices, Publication, Publications, Publishing, Rapid Development, Research, Science, Small, Sources, Species, Term, Universities

# Title: SIAM Journal on Mathematical Analysis

Full Journal Title: [SIAM Journal on Mathematical Analysis](http://epubs.siam.org/SIMA/sima_toc.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Mikelić, A. and Bruining, H. (2008), Analysis of model equations for stress-enhanced diffusion in coal layers. Part I: Existence of a weak solution. *SIAM Journal on Mathematical Analysis*, **40** (4), 1671-1691.

Full Text: [2008\SIAM J Mat Ana40, 1671.pdf](2008/SIAM%20J%20Mat%20Ana40,%201671.pdf)

Abstract: This paper is motivated by the study of the sorption processes in the coal. They are modeled by a nonlinear degenerate pseudoparabolic equation for stress-enhanced diffusion of carbon dioxide (CO2) in coal, partial derivative(t)phi = partial derivative(x) {D(phi) partial derivative(x)phi+D(phi)phi/B partial derivative(x) (e(-m phi)partial derivative(t)phi)}, where B, m are positive constants and the diffusion coefficient D(phi) has a small value when the CO2 volume fraction phi is 0 <= phi < phi(c), representative of coal in the glass state and orders of magnitude higher value for phi > phi(c), when coal is in the rubber-like state. These types of equations arise in a number of cases when nonequilibrium thermodynamics or extended nonequilibrium thermodynamics is used to compute the flux. For this equation, existence of the travelling wave-type solutions was extensively studied. Nevertheless, the existence seems to be known only for a sufficiently short time. We use the corresponding entropy functional in order to get existence, for any time interval, of an appropriate weak solution with square integrable first derivatives and satisfying uniform L-infinity-bounds. Due to the degeneracy, we obtain square integrability of the mixed second order derivative only in the region where the concentration phi is strictly positive. In obtaining the existence result it was crucial to have the regularized entropy as unknown for the approximate problem and not the original unknown (the concentration).

Keywords: Capillary-Pressure, Carbon, Carbon Dioxide, CO2, Coal, Concentration, Darcy Flow Model, Degenerate Pseudoparabolic Equation, Diffusion, Diffusion Coefficient, Entropy, Entropy Methods, First, Glass, Interval, Macromolecular Structure, Model, Penetrants, Polymers, Porous-Media, Pressure Saturation Relation, Regularization, Second Order, Second-Order, Small, Solution, Solutions, Sorption, State, Stress-Enhanced Diffusion, Thermodynamics, Transport, Value, Volume

# Title: SIAM Journal on Scientific and Statistical Computing

Full Journal Title: SIAM Journal on Scientific and Statistical Computing

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0196-5204

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Wold, S., Ruhe, A., Wold, H. and Dunn, W.J. (1984), The collinearity problem in linear-regression - the partial least-squares (pls) approach to generalized inverses. *SIAM Journal on Scientific and Statistical Computing*, **5** (3), 735-743.

Full Text: [1984\Sia J Sci Sta Com5, 735.pdf](1984/Sia%20J%20Sci%20Sta%20Com5,%20735.pdf)

Abstract: The use of partial least squares (PLS) for handling collinearities amongthe independent variables $X$ in multiple regression is discussed. Consecutiveestimates $({\text{rank }}1,2,\cdots)$ are obtained using the residuals fromprevious rank as a new dependent variable $y$. The PLSmethod is equivalent to the conjugate gradient method used inNumerical Analysis for related problems.To estimate the ‘optimal’ rank, crossvalidation is used. Jackknife estimates of the standard errors arethereby obtained with no extra computation.The PLS method is comparedwith ridge regression and principal components regression on a chemicalexample of modelling the relation between the measured biological activityand variables describing the chemical structure of a set of substituted phenethylamines.

Keywords: Collinearity, Linear Regression, Conjugate Gradients, Principal Components, Cross Validation, Chemometrics

# Title: Sibirskii Biologicheskii Zhurnal

Full Journal Title: Sibirskii Biologicheskii Zhurnal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0869-1347

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Markova, O. (1992), The tendency of development of research on ecological and phytocoenotic diversity of natural grasslands of Siberia: Experience with bibliometric analysis. *Sibirskii Biologicheskii Zhurnal*, **0** (1), 56-60.

Abstract: The present paper was devoted to application of bibliometric analysis of documentary information current for the purpose of determining the state and the tendency of the development of a specific scientific direction. The results of this research are used for prediction of the development of science, because the information current is an information model of the system of the scientific knowledge. A bibliometric analysis of the information current on the theme ‘Ecological and phytocoenotic diversity of natural grassland of Siberia’ was done. This theme is one of the most important aspects in research of rational use and reproduction of plant resources of hayfields and pastures. The analysis was based on materials of abstract journals of VINITI ‘Biology’ and ‘Plant-growing’ and the bibliography ‘Soils, vegetable and animals of Siberia and Far East’ during 1985-1989 years. 671 documents on ecological and phytocoenotic investigations of natural grassland in this country and abroad were exposed. The tendency of quantitative rise of the information current and fluctuation character of its temporal dynamics were established. The part of the home information in general information current constitutes 50-60 per cent. The part of the Siberian information (current in home information current constitutes 40-50 per cent. It is explained by significant areas of natural grassland in this country and in Siberia, which are represented by different types of plant communities. A wide range of editions, which publicate this information was exposed. They are: monographs, thematic collections, periodic editions, author’s abstracts of dissertations, materials of conferences, deposited papers. A fundamental part of the home information was presented in thematic collections, and the foreign information was presented in periodic editions. The results of this research show the high degree of elaboration of this thematic direction, its scientific and practical importance and the possibility of using the bibliometric analysis for estimation and prediction of the development of the scientific direction.

# Title: Sichuan Daxue Xuebao (Gongcheng Kexue Ban)/Journal of Sichuan University (Engineering Science Edition)

Full Journal Title: [Sichuan Daxue Xuebao (Gongcheng Kexue Ban)/Journal of Sichuan University (Engineering Science Edition)](http://www.scopus.com/scopus/source/sourceInfo.url?sourceId=24344)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1009-3087

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liu, Y., Xiao, D., Yang, W.S., Guo, L.H. and Li, H. (2005), Research on the kinetics and isotherms for lead(II) adsorption on vermiculite. *Sichuan Daxue Xuebao (Gongcheng Kexue Ban)/Journal of Sichuan University (Engineering Science Edition)*, **37** (5), 62-67.

Abstract: The adsorption ratio of Pb2+ with concentrations of 10 to 160 mg/L on the vermiculite is more than 99.0%, and the maximal sorption capacity is 87.72 mg/g under the conditions of adsorption for 30 min and pH = 6.0. Pseudo second order model best describe the reaction rate, adsorption capacity calculated by the model is consistent with that actual measurement, which the correlation coefficient (r) is 0.9999. The adsorption isotherms of Pb2+ with different temperature are divided to two parts. The experimental data with Pb2+ concentrations from 200 to 500 mg/L follow both Langmiur and Freundlich isotherm model, which r is 0.992 and 0.998 respectively at 10°C. The equilibrium adsorption capacity increases with increasing temperature from 10 to 80°C, which indicates that the adsorption process is endothermic. For the adsorption process, the enthalpy is 4.02 kJ/mol, the entropy is 27.41 J/(mol·K), and the free energy is -3.74 (10°C), -4.46 (35°C), -5.01 (60°C), -5.72 (70°C) kJ/mol respectively.

Keywords: Kinetics, Lead, Thermodynamics, Vermiculite

# Title: SIGMOD Record

Full Journal Title: [SIGMOD Record](http://portal.acm.org/browse_dl.cfm?linked=1&part=newsletter&idx=J689&coll=portal&dl=ACM), [SIGMOD Record](http://www.informatik.uni-trier.de/~ley/db/journals/sigmod/index.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Elmacioglu, E. and Lee, D.W. (2005), On six degrees of separation in DBLP-DB and more. *SIGMOD Record*, **34** (2), 33-40.

Full Text: [2005\Sig Rec34, 33.pdf](2005/Sig%20Rec34,%2033.pdf)

Abstract: An extensive bibliometric study on the db community using the collaboration network constructed from DBLP data is presented. Among many, we have found that (1) the average distance of all db scholars in the network has been stabilized to about 6 for the last 15 years, coinciding with the so-called six degrees of separation phenomenon, (2) In sync with Lotka’s law on the frequency of publications, the db community also shows that a few number of scholars publish a large number of papers, while the majority of authors publish a small number of papers (i.e., following the power-law with exponent about -2), and (3) with the increasing demand to publish more, scholars collaborate more often than before (i.e., 3.93 collaborators per scholar and with steadily increasing clustering coefficients).

Keywords: Bibliometric, Bibliometric Study, Collaboration, Network, Publications

# Title: Signal Processing

Full Journal Title: Signal Processing

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? (2007), Most cited paper award - Asok Ray. *Signal Processing*, **87** (7), 1816.

Full Text: 2007\Sig Pro87, 1816.pdf

? Fletcher, T. and Joshi, S. (2010), Most cited paper award 2010. *Signal Processing*, **90** (10), 2898.

Full Text: [2010\Sig Pro90, 2898.pdf](2010/Sig%20Pro90,%202898.pdf)

# Title: Simulation-Transactions of the Society for Modeling and Simulation International

Full Journal Title: Simulation-Transactions of the Society for Modeling and Simulation International

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Mustafee, N., Katsaliaki, K. and Taylor, S.J.E. (2010), Profiling literature in healthcare simulation. *Simulation-Transactions of the Society for Modeling and Simulation International*, **86** (8-9), 543-558.

Abstract: The publications that relate to the application of simulation to healthcare have steadily increased over the years. These publications are scattered amongst various journals that belong to several subject categories, including operational research, health economics and pharmacokinetics. The simulation techniques that are applied to the study of healthcare problems are also various. The aim of this study, therefore, is to review healthcare simulation literature that have been published between 1970 and 2007 in high-quality journals belonging to various subject categories and that report on the application of four simulation techniques, namely, Monte Carlo simulation, discrete-event simulation, system dynamics and agent-based simulation. Arguably, journal impact factor is fundamental in assessing the quality of publications. Thus, the 201 publications selected for review have been queried from the ISI Web of Science (R) bibliographic database of high-impact research journals. Through a review of healthcare simulation literature the following three objectives have been realized: (a) papers have been categorized under the different simulation techniques, and the healthcare problems that each technique is employed to investigate are identified; (b) variables such as authors, article citations, etc., within our dataset of healthcare papers have been profiled; (c) turning point (strategically important) papers and authors have been identified through co-citation analysis of references cited by the papers in our dataset. The above objectives have been realized by devising and then employing a methodology for profiling literature. It is expected that this review paper will help the readers gain a broader understanding of research in healthcare simulation.

Keywords: Analysis, Authors, Bibliographic, Bibliographic Database, Citations, Co-Citation Analysis, Cocitation, Discrete-Event Simulation, Economics, Emergency, Health Economics, Healthcare, Healthcare Research, Impact, Impact Factor, Information-Systems, Intellectual Structure, ISI, ISI Web of Science, Journal, Journal Impact Factor, Journals, Knowledge, Literature, Methodology, Papers, Profiling Research, Public-Health, Publications, Quality of Publications, Research, Review, Risk Assessment, Science, Simulation Research, Time, Web of Science

# Title: Singapore Medical Journal

Full Journal Title: Singapore Medical Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Peh, W.C.G. and Ng, K.H. (2010), Publication ethics and scientific misconduct. *Singapore Medical Journal*, **51** (12), 908-912.

Abstract: To maintain the readers’ trust and to uphold the journal’s reputation, it is paramount for the entire research, peer reviewer and publication process to follow ethical principles and decisions. Studies involving humans, animals, medical records and human tissues/organs need to be conducted ethically, and the appropriate approvals obtained. The privacy and confidentiality of patients, authors and reviewers should be respected. When required, rights and permissions should be sought. Common forms of scientific misconduct include misappropriation of ideas, violation of generally accepted research practices, failure to comply with legislative and regulatory requirements, falsification of data, and inappropriate behaviour in relation to misconduct. Authors can expect editorial action to be taken, should duplicate publication, plagiarism and other forms of scientific misconduct be attempted or detected.

Keywords: Authors, Data Falsification, Duplicate Publication, Ethics, Ethics Committee, Institutional Review Board, Joint Statement, Malaysia, Misconduct, Plagiarism, Publication, Publication Ethics, Research, Rights and Permissions, Scientific Misconduct

# Title: Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften

Full Journal Title: Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Einstein, A. (1916), Approximate integration of field equations of gravitation. *Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften*, 688-696.

Keywords: Field, Integration

Notes: highly cited

? Einstein, A. (1917), Cosmological observations on the general theory of relativity. *Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften*, 142-152.

Keywords: General, Theory

# Title: Sitzungsberichte der Preussichen Akademie der Wissenschaften Physikalisch-Mathematische Klasse

Full Journal Title: Sitzungsberichte der Preussichen Akademie der Wissenschaften Physikalisch-Mathematische Klasse

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Einstein, A. (1924), Quantum theory of monatomic ideal gases. *Sitzungsberichte der Preussichen Akademie der Wissenschaften Physikalisch-Mathematische Klasse*, 261-267.

Keywords: Theory

Notes: highly cited

? Einstein, A. (1925), Quantum theory of mono-atomic ideal gas. Second paper. *Sitzungsberichte der Preussichen Akademie der Wissenschaften Physikalisch-Mathematische Klasse*, 3-14.

Keywords: Theory

# Title: Skin Pharmacology and Applied Skin Physiology

Full Journal Title: [Skin Pharmacology and Applied Skin Physiology](http://content.karger.com/ProdukteDB/produkte.asp?Aktion=BackIssuesJG&ProduktNr=224194)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wille, J.J., Kydonieus, A.F. and Kalish, R.S. (1998), Inhibition of irritation and contact hypersensitivity by ethacrynic acid. *Skin Pharmacology and Applied Skin Physiology*, **11** (4-5), 279-288.

Full Text: Ski Pha App Ski Phy11, 279

Abstract: The immunosuppressive effect of topical ethacrynic acid (ECA) was tested on both the induction and elicitation phases of contact sensitization in a mouse model, ECA (0.5% in vehicle) reduced the sensitization response by >50% when the sensitizer was either dinitrochlorobenzene (DNCB), oxazalone (OX) or para-phenylenediamine (PPD), and was applied 1 day later to the ECA-pretreated skin site, The immunosuppressive effect of combining ECA with either hydrocortisone or with cis-urocanic acid was also tested. An additive suppressive effect was observed with ECA in both combinations. The effect of ECA (1% in vehicle) on blocking the elicitation phase was also examined in a mouse ear edema assay. ECA was highly effective in preventing the challenge response in mice previously sensitized to either DNCB, OX or PPD, ECA (1% in vehicle) was also tested for its ability to inhibit contact irritation, ECA (1% in vehicle) was highly effective in preventing ear edema due to topically applied skin irritants including arachidonic acid, capsaicin, lactic acid, phorbol myristate acetate, trans-retinoic acid, and sodium lauryl sulfate, ECA may be useful for both prophylaxis and therapeutic treatment of diverse skin conditions including contact dermatitis, eczema, and other related allergic skin disorders.

Keywords: Allergic Contact Dermatitis, Ethacrynic Acid, Skin Irritation, Skin Sensitization, Necrosis-Factor-Alpha, Delayed-Type Hypersensitivity, Topically Applied Drugs, Urocanic Acid, Langerhans Cells, Human Skin, Induction, Sensitization, Antigen, Keratinocytes

? Wille, J.J., Kydonieus, A. and Kalish, R.S. (2000), Inhibition of irritation and contact hypersensitivity by phenoxyacetic acid methyl ester in mice. *Skin Pharmacology and Applied Skin Physiology*, **13** (2), 65-74.

Full Text: Ski Pha App Ski Phy13, 65

Abstract: New anti-irritant treatments are required to prevent irritation and sensitization reactions to consumer medicines and dermatological drugs. We report here that phenoxyacetic acid methyl ester (PAME) is an effective agent to prevent and treat irritant and allergic contact dermatitis. Balb/c mice skin-treated with 1% FAME do not lose weight relative to vehicle-treated mice, nor is it irritating to mouse skin. Topical FAME prevents skin irritation to a wide variety of irritants including: arachidonic acid, capsaicin, sodium lauryl sulfate (SLS), disodium laureth sulfosuccinate and tetradecanoylphorbol-13-acetate. Histological studies showed that 1% FAME greatly diminished dermal neutrophilic infiltration and dermal capillary vessel dilation, and prevented epidermal hyperproliferation and hyperkeratosis that accompanies detergent (SLS)-induced skin irritation. Topical FAME inhibited ear swelling following ear challenge during the elicitation phase of contact hypersensitivity in mice sensitized with 1-chloro-2,4-dinitrochlorobenzene (DNCB), oxazolone and the hair coloring dye rho-phenylenediamine (PPD). Finally, topical administration of 1% FAME prior to PPD or DNCB sensitization prevented the induction phase of contact hypersensitivity. These results indicate that FAME represents a potential new category of potent topical anti-inflammatory agents. Copyright (C) 2000 S.Karger AG, Basel.

Keywords: Anti-Inflammatory Agents, Contact Irritant and Allergic Dermatitis, Ethacrynic Acid, Diuretic Drugs, Phenoxyacetic Acid Esters, Sensitization, Sensitization, Amiloride

# Title: Skull Base-An Interdisciplinary Approach

Full Journal Title: Skull Base-An Interdisciplinary Approach

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Figueiredo, E.G., Soga, Y., Amorim, R.L.O., Oliveira, A.M.P. and Teixeira, M.J. (2011), The puzzling olfactory groove schwannoma: A systematic review. *Skull Base-An Interdisciplinary Approach*, **21** (1), 31-35.

Abstract: We systematically reviewed the literature concerning the anterior cranial fossa schwannomas to understand their pathogenesis, determine their origin, and standardize the terminology. We performed a MEDLINE, EMBASE, and Science Citation Index Expanded search of the literature, age, gender, clinical presentation, presence or absence of hyposmia, radiological features, and apparent origin were analyzed and tabulated. Cases in a context of neurofibromatosis and nasal schwannomas with intracranial extension were not included. Age varied between 14 and 63 years (mean = 30.9). There were 22 male and 11 female patients. The clinical presentation included seizures (n = 15), headache (n = 16), visual deficits (n = 7), cognitive disturbances (n = 3), and rhinorrhea (n = 1). Hyposmia was present in 14 cases, absent in 13 cases (39.3%), and unreported in five. Homogeneous and heterogeneous contrast enhancement was observed in 14 and 15 cases, respectively. The region of the olfactory groove was the probable site in 96.5%. Olfactory tract could be identified in 39.3%. The most probable origin is the meningeal branches of trigeminal nerve or anterior ethmoidal nerves. Thus, olfactory groove schwannoma would better describe its origin and pathogenesis and should be the term preferentially used to name it.

Keywords: Age, Anterior Cranial Fossa, Clinical, Context, Disturbances, Enigmatic Origin, Female, Gender, Hyposmia, Intracranial Subfrontal Schwannoma, Literature, Male, Medline, Nerves, Olfactory Groove, Olfactory Nerve, Origin, Pathogenesis, Patients, Presentation, Schwannomas, Science Citation Index, Seizures, Site, Subfrontal Tumors, Term, Terminology, Tumor

# Title: Slavic Review

Full Journal Title: Slavic Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ermolaev, H. (2007), Boris Pil’njaks des selbstzitats in den 30er jahren. *Slavic Review*, **66** (3), 570-571.

? Ermolaev, H. (2007), Boris Pil’njak’s poetics of the self citation in the 30s. *Slavic Review*, **66** (3), 570-571.

Full Text: [2007\Sla Rev66, 570.pdf](2007/Sla%20Rev66,%20570.pdf)

Keywords: Citation, Self-Citation

# Title: Sleep

Full Journal Title: Sleep

ISO Abbreviated Title: Sleep

JCR Abbreviated Title: Sleep

ISSN: 0161-8105

Issues/Year: 8

Journal Country United States

Language: English

Publisher: Amer Acad Sleep Medicine

Publisher Address: One Westbrook Corporate Ctr, Ste 920, Westchester, IL 60154

Subject Categories:

Clinical Neurology: Impact Factor 5.126, 12/147 (2006)

Neurosciences: Impact Factor 5.126, 28/200 (2006)

? Lu, S., Wu, C. and Ho, Y.S. (2007), Bibliometric analysis of insomnia-related research in the period of 1991-2005. *Sleep*, **30** (S), A260-A261.

Full Text: [2007\Sleep30, A260.pdf](2007/Sleep30,%20A260.pdf)

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Research

? Lu, S., Wu, C. and Ho, Y. (2007), Bibliometric analysis of insomnia-related research in the period of 1991-2005. *Sleep*, **30**, 763.

Keywords: analysis, Bibliometric, Bibliometric analysis, research

# Title: Sleep Medicine Reviews

Full Journal Title: [Sleep Medicine Reviews](http://www.sciencedirect.com/science/journal/10870792)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1087-0792

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lavie, P. (2008), Who was the first to use the term Pickwickian in connection with sleepy patients? History of sleep apnoea syndrome. *Sleep Medicine Reviews*, **12** (1), 5-17.

Full Text: [2008\Sle Med Rev12, 5.pdf](2008/Sle%20Med%20Rev12,%205.pdf)

Abstract: The symptoms and characteristics of steep apnoea syndrome-excessive daytime sleepiness, loud snoring, restless and non-restorative steep-are so impressive that it is difficult to understand why its recognition was delayed until the 1970s. The Centennial book of the American Thoracic Society credited Sidney Burwell for the discovery of Obstructive Steep Apnoea Syndrome. This is only one of the many mistakes and misattributions regarding the history of steep apnoea syndrome. The earliest descriptions of patients who presumably suffered from steep apnoea were made in the 19th century. The term “Pickwickian” in connection with sleepy patients was introduced in 1889. The first electrophysiological steep recordings of Pickwickian patients and the understanding of the syndrome as disordered breathing in sleep, were made during the late 1950s and 1960s. Its recognition as a public health problem was facilitated by Young et at.’s [Young T, Palta M, Dempsey J, et at. The occurrence of steep-disordered breathing among middle-aged adulte. N Engl J Med 1993,328:1230-5] seminal paper documenting the prevalence of the syndrome in the general population, and by the accumulated evidence that the syndrome is a major cardiovascular risk factor. Bibliometric analysis of the literature on steep apnoea reveals that future research will focus on the tong-term outcomes of the syndrome, on the effects of treatment, and on the underlying mechanisms linking it with cardiovascular morbidity. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Pickwickian, Sleep Apnoea, History, Bibliometric Analysis, Positive Airway Pressure, Excessive Daytime Sleepiness, C-Reactive Protein, Heart-Failure, Cardiovascular Outcomes, Blood-Pressure, Controlled-Trial, Association, Hypopnea, Men

? Cooper, K.L. and Relton, C. (2010), Homeopathy for insomnia: A systematic review of research evidence. *Sleep Medicine Reviews*, **14** (5), 329-337.

Full Text: [2010\Sle Med Rev14, 329.pdf](2010/Sle%20Med%20Rev14,%20329.pdf)

Abstract: Background: Insomnia is a common problem which impacts on quality of life. Current management includes psychological and behavioural therapies and/or pharmacological treatments.

Objective: To systematically review research evidence for effectiveness of homeopathy in the management of insomnia.

Methods: Comprehensive searches of biomedical databases (MEDLINE, EMBASE, CINAHL, Cochrane library, Science Citation Index), homeopathy-specific and complementary medicine-specific databases were conducted.

Results: (A) Homeopathic medicines: four randomised controlled trials (RCTs) compared homeopathic medicines to placebo. All involved small patient numbers and were of low methodological quality. None demonstrated a statistically significant difference in outcomes between groups, although two showed a trend favouring homeopathic medicines and three demonstrated significant improvements from baseline in both groups. A cohort study reported significant improvements from baseline. (B) Treatment by a homeopath: No randomised controlled trials of treatment by a homeopath were identified. One cohort study, three case series and over 2600 case studies were identified. Conclusions: The limited evidence available does not demonstrate a statistically significant effect of homeopathic medicines for insomnia treatment. Existing RCTs were of poor quality and were likely to have been underpowered. Well-conducted studies of homeopathic medicines and treatment by a homeopath are required to examine the clinical and cost effectiveness of homeopathy for insomnia. (c) 2009 Elsevier Ltd. All rights reserved.

Keywords: Systematic Review, Insomnia, Homeopathy, Homeopathic Medicines, Treatment by a Homeopath, Clinical Effectiveness Trial, Randomized-Controlled-Trial, Cognitive-Behavior Therapy, Hypnotic Drug-Use, Psychological Treatment, Persistent Insomnia, General-Practice, Double-Blind, Medicine, Health

# Title: Slow Dynamics in Complex Systems

Full Journal Title: Slow Dynamics in Complex Systems

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0094-243X

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hossain, M.A., Kumita, M. and Mori, S. (2004), Sorption dynamics of Cr(VI) on used black tea leaves. *Slow Dynamics in Complex Systems*, **708**, 394-397.

Abstract: Sorption efficiency of Cr(VI) on used black tea leaves from aqueous solutions was evaluated. Kinetic studies were conducted using a batch process, and the effects of Cr(VI) concentration, solution pH and temperature on the adsorption and reduction performance were investigated. The adsorption kinetics follows pseudo-second order rate equation better than pseudo-first order one. The rate constant of pseudo-second order adsorption decreases with increasing an initial concentration of Cr(VI), up to a certain limit, then becomes steady. The maximum value of the rate constant was observed at an initial solution pH = 1.3. The rate constant was found to linearly increase with an increase in temperature, showing that the process is endothermic. The activation energy of adsorption calculated from Arrhenius plot is 16.3 kJ/mol, indicating that the adsorption occurred easily.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Kinetics, Aqueous Solutions, Batch, Batch Process, Black, Concentration, Cr(VI), Dynamics, Effects, Efficiency, Endothermic, Energy, Ions, Kinetic, Kinetic Studies, Kinetics, Performance, pH, Process, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constant, Reduction, Solution, Solutions, Sorption, Temperature, Used Black Tea Leaves, Value

# Title: Soap & Cosmetics

Full Journal Title: Soap & Cosmetics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Micheels, C. (1999), Careful chemistry: Responsible Care (R) faces the next decade. *Soap & Cosmetics*, **75** (7), 38-??.

# Title: Social Biology

Full Journal Title: Social Biology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Osborne, R.H. (1982), Introduction to the memorial volume - the Most frequently cited articles of *Social Biology*. *Social Biology*, **29** (1-2), 1-3.

? Osborne, R.H. (1982), The osborn, frederick memorial volume - Introduction to Part-2 of the memorial volume - the most frequently cited articles of *Social Biology*. *Social Biology*, **29** (3-4), R3-R5.

? Osborne, R.H. and Osborne, B.T. (1999), The most frequently cited articles published in *Social Biology*, 1961-1999. *Social Biology*, **46** (3-4), 194-206.

Full Text: Soc Bio46, 194.pdf

# Title: Social Dynamics-A Journal of the Centre for African Studies University of Cape Town

Full Journal Title: Social Dynamics-A Journal of the Centre for African Studies University of Cape Town

ISO Abbrev. Title: Soc. Dyn.-J. Cent. Afr. Stud. Univ. Cape Town

JCR Abbrev. Title: Soc Dynamics

ISSN: 0253-3952

Issues/Year: 2

Language: English

Journal Country/Territory: South Africa

Publisher: Routledge Journals, Taylor & Francis Ltd

Publisher Address: 4 Park Square, Milton Park, Abingdon OX14 4RN, Oxfordshire, England

Subject Categories:

Area Studies: Impact Factor 0.237, 32/44 (2009)

? Ross, R. (1990), The top-hat in South African history - the changing significance of an article of material culture. *Social Dynamics-A Journal of the Centre for African Studies University of Cape Town*, **16** (1), 90-100.

Keywords: History, Jun

# Title: Social Forces

Full Journal Title: [Social Forces](http://www.jstor.org/journals/00377732.html)

ISO Abbrev. Title: Soc. Forces

JCR Abbrev. Title: Soc Forces

ISSN: 0037-7732

Issues/Year: 4

Language: English

Journal Country/Territory: United States

Publisher: Univ North Carolina Press

Publisher Address: Box 2288, Journals Dept, Chapel Hill, NC 27515-2288

Subject Categories:

Sociology: Impact Factor 1.379, 23/114 (2009)

Quarantelli, E.L. (1995), Community reconstruction after an earthquake: Dialectical sociology in action-Rossi, I. *Social Forces*, **73** (3), 1153-1154.

Full Text: [S\Soc For73, 1153.pdf](S/Soc%20For73,%201153.pdf)

Merton, R.K. (1995), The Thomas theorem and the Matthew effect. *Social Forces*, **74** (2), 379-424.

Full Text: [S\Soc For74, 379.pdf](S/Soc%20For74,%20379.pdf)

# Title: Social Indicators Research

Full Journal Title: [Social Indicators Research](http://www.springerlink.com/(iytdfsi5jwld2bzo4i2azj45)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:102994,1;&absoluteposition=208#A208)

ISO Abbreviated Title: Soc. Indic. Res.

JCR Abbreviated Title: Soc Indic Res

ISSN: 0303-8300

Issues/Year: 9

Journal Country Netherlands

Language: English

Publisher: Springer

Publisher Address: Van Godewijckstraat 30, 3311 GZ Dordrecht, Netherlands

Subject Categories:

Social Sciences, Interdisciplinary: Impact Factor 0.835, 25/68 (2009)

Sociology: Impact Factor 0.835, 56/114 (2009)

? Hubert, J.J. (1977), Bibliometric models for journal productivity. *Social Indicators Research*, **4** (4), 441-473.

Full Text: [1960-80\Soc Ind Res4, 441.pdf](1960-80/Soc%20Ind%20Res4,%20441.pdf)

Abstract: Bibliometrics is the collection of statistical methods which are applicable to various media of communication. For scientific discourse, such as journals, many models have characterized their productivity. This paper presents a detailed chronological survey of these models. One common notation is used, derivation and proofs are in a statistical framework and new relationships are illustrated. We also provide a list of relevant papers and examine those which have used these models.

Keywords: Bibliometric, Models

? Ying, Y.W. (1992), Life satisfaction among San-Francisco Chinese-Americans. *Social Indicators Research*, **26** (1), 1-22.

Full Text: [1992\Soc Ind Res26, 1.pdf](1992/Soc%20Ind%20Res26,%201.pdf)

Abstract: This study investigates variables that predict life satisfaction in a group of 142 San Francisco Chinese-Americans by utilizing Campbell, Converse and Rodgers’ model (1976) of life quality. While objective demographic variables failed to make a significant contribution, satisfaction level with life domains examined (i.e., work, health, marriage/singlehood, friendship and biculturality) accounted for 37% of the variance in life satisfaction, with all but the combined work domain satisfaction score emerging as significant predictors of overall life satisfaction. Subgroup analyses reveal biculturality satisfaction as the most powerful predictor of life satisfaction in immigrants, but not in American-borns, for whom level of friendship satisfaction is most predictive of life quality. These findings and their implications are discussed.

Keywords: Perceptions, Cognition, Marriage, Models

? Lind, N.C. (1996), Life quality measures of smoking. *Social Indicators Research*, **37** (2), 207-218.

Full Text: [1996\Soc Ind Res37, 207.pdf](1996/Soc%20Ind%20Res37,%20207.pdf)

Abstract: The cost of smoking has three principal dimensions: money, reduced life expectancy, and diminished health. Each component can be quantified, all have an influence on the quality and duration of life. The combined influence can be evaluated using an aggregated social indicator, such as the Life Quality Index. It can be expressed in various ways, e.g. as an equivalent move to a nation or to a time with a lower level of the LQI, as an equivalent economic loss, or as an equivalent loss of life expectancy. To illustrate, the analysis is applied to Danish data on smoking, the cost for a typical pack-a-day habit is equivalent to a 57% reduction in personal income, 8.6 years loss of life expectancy, or a 4% drop in the Life Quality Index. These measures underscore the seriousness of smoking as a health hazard.

? McPheat, D. (1996), Technology and life-quality. *Social Indicators Research*, **37** (3), 281-301.

Full Text: [1996\Soc Ind Res37, 281.pdf](1996/Soc%20Ind%20Res37,%20281.pdf)

Abstract: This paper examines some of the effects of technology on quality of life (QOL) that are suggested in the classical and mole recent literature. It argues that confusion concerning the impact of technology is reduced by using a simple definition of it and by analysing its interrelationships with five other key variables of social structure with also influence QOL. It is argued that economic rationalism which produces mainstream technology and structure may prevent the maximisation of QOL because of their negative effects on health and the quality of relationships. In this case, the introduction of alternative technology and social structure requires a devaluation of material wealth and a more positive valuation of health and the quality of relationships.

? Pandey, M.D. and Nathwani, J.S. (1996), Measurement of socio-economic inequality using the life-quality index. *Social Indicators Research*, **39** (2), 187-202.

Full Text: [1996\Soc Ind Res39, 187.pdf](1996/Soc%20Ind%20Res39,%20187.pdf)

Abstract: As income inequality presents a narrow view of overall inequality prevailing in a society, the paper focuses on its much broader definition, referred to as socio-economic inequality, which considers the disparities in income as well as in mortality, and standard of living. The paper presents a new method for measuring the socio-economic inequality using a composite social indicator, Life-Quality Index, derived from two principal indicators of development, namely, the Real Gross Domestic Product per person and the life expectancy at birth. Income inequality and the associated life expectancy variations are integrated into a quality adjusted income (QAI), to account for the observed differentials in life-quality of various quintiles of the population. The Gini coefficient of the distribution of QAI is introduced as a measure of socio-economic inequality. The proposed approach is illustrated using data on life expectancy of five income quintiles in urban Canada. It is found that the magnitude of inequality in Canada is higher than that reflected by the traditional measure, the Gini coefficient of income.

Keywords: Mortality, Health, Income, life-quality, life expectancy, Real Gross Domestic Product, inequality, Gini coefficient, income Lorenz curve, human development

? Illner, M. (1998), The changing quality of life in a post-communist country: The case of Czech Republic. *Social Indicators Research*, **43** (1-2), 141-170.

Full Text: [S\Soc Ind Res43, 141.pdf](S/Soc%20Ind%20Res43,%20141.pdf)

Abstract: Societal transformation which followed the fall of Communism in Czech Republic has affected many aspects of people’s lives. In this paper, we describe the main institutional and structural transformations which induced changes in life-quality after 1989 and sketch thereafter some of the changes themselves. It is mostly the changing living conditions which we cover in the contribution: 1. democracy and civil rights, 2. employment and unemployment, 3. incomes, earnings and the quality of consumption, 4. poverty, 5. housing, 6. environment, 7. health, 8. crime, corruption and social pathology. Some tentative conclusions are proposed: the changes have been contradictory-positive on some dimensions of life-quality (democracy, civil rights, environment, health), negative on another set (crime and social pathology, housing) and inconclusive in the rest (incomes, wages, employment). It is, however, premature to draw definite conclusions, as the process of transformation has not yet reached its end. Judging from subjective evaluation of the overall life quality, the recent picture was encouraging: in 1996, the majority of Czech population said they were satisfied wit how they live. Not only life-quality has changed after 1989, but also the understanding of what good life means.

Keywords: Europe

# Title: Social Networks

Full Journal Title: [Social Networks](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5969&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=0582953df589a90f467f204cb765fe49)

ISO Abbrev. Title: Soc. Networks

JCR Abbrev. Title: Soc Networks

ISSN: 0378-8733

Issues/Year: 4

Language: English

Journal Country/Territory: Switzerland

Publisher: Elsevier Science BV

Publisher Address: Po Box 211, 1000 Ae Amsterdam, Netherlands

Subject Categories:

Anthropology: Impact Factor 2.349, 5/67 (2009)

Sociology: Impact Factor 2.349, 4/114 (2009)

Hummon, N.P. and Doreian, P. (1989), Connectivity in a citation network - The development of DNA theory. *Social Networks*, **11** (1), 39-63.

Full Text: [S\Soc Net11, 39.pdf](S/Soc%20Net11,%2039.pdf)

# Title: Social Psychiatry and Psychiatric Epidemiology

Full Journal Title: Social Psychiatry and Psychiatric Epidemiology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Reigstad, B., Jorgensen, K. and Wichstrom, L. (2004), Changes in referrals to child and adolescent psychiatric services in Norway 1992-2001. *Social Psychiatry and Psychiatric Epidemiology*, **39** (10), 818-827.

Full Text: [2004\Soc Psy Psy Epi39, 818.pdf](2004/Soc%20Psy%20Psy%20Epi39,%20818.pdf)

Abstract: Background The study analyzes changes in types of problems referred to child and adolescent psychiatry in Norway from 1992 to 2001, and investigates if referral practices and media attention account for these changes. Method All referrals to child and adolescent psychiatry in Norway in the period 1992-2001 were analyzed, as well as frequencies of articles in media on psychiatric problems. Results The shares of referrals for sadness/depression increased from 0.5 % to 15.4 %. Referrals for hyperactivity/attention problems increased from 1.2 % to 13.6 %. The increases could be statistically attributed to decreased use of other referral categories, and/or alternatively to media attention on these and related topics. Convergence between diagnosis and corresponding referral problem increased in the period. Conclusions Referrals for sadness/depression and hyperactivity/attention problems increased sharply in Norway during the 1990s. This increase may be attributed to a different understanding of and a sharper look at these problems by referral agencies and by increased media attention.

Keywords: Adolescent, Adolescent Psychiatry, Changes, Child, Diagnosis, Media, Norway, Practices, Psychiatry, Services, Understanding

# Title: Social Science Information Sur les Sciences Sociales

Full Journal Title: [Social Science Information Sur les Sciences Sociales](http://ssi.sagepub.com/archive/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bontems, V. and Gingras, Y. (2007), From normal science to marginal science. Analysis of scientific trajectory bifurcation: The case of theory of scale relativity. *Social Science Information Sur les Sciences Sociales*, **46** (4), 607-653.

Full Text: [2009\Soc Sci Inf Sci Soc46, 607.pdf](2009/Soc%20Sci%20Inf%20Sci%20Soc46,%20607.pdf)

Abstract: In the scientific field, agents can choose to contribute to ‘normal’ science, operate within the most highly legitimated avant-garde science (‘superstrings’, dark matter, etc.) or instead, develop theories within an entirely new theoretical framework, despite the risks which this entails. But the marginality of such theories raises a problem of strategy: those who choose to work on them do so at the expense of their own short-term interests, which would normally be oriented towards occupying a central position in already well-established fields. The theory of scale-relativity (TSR) demonstrates the interest of such a situation: the door is open to new possibilities, but ones that must be built ‘from scratch’. To pursue work in this direction is more demanding than to choose a project considered risky (due to its inherent difficulty) within the confines of an existing paradigm. On the one hand, TSR proposes to ‘innovate’ and branch out from already widely-accepted conceptual bases, while, on the other hand, it finds itself in a marginal position with respect to the most legitimate avant-garde theories, such as ‘superstrings’. The case of the TSR thus allows us to study a region of the scientific field which has hardly been explored by a sociology of science that focuses primarily on ‘extreme’ cases: histories of theories which have since been vindicated or spectacular controversies. In 2006, TSR occupies a marginal position within the field of physics. Its status differs widely from ‘theories’ produced outside the field, yet does not correspond to any form of stable, accepted science. As we will show, using a detailed bibliometric analysis, the theory’s diffusion throughout the scientific field has been limited - albeit real and its results, when sanctioned by an official publication, are rarely taken into account by researchers who are not already TSR collaborators. This isolation within the field reveals conflict and tension between the transformation intended by a theoretical innovation and the norms of standard peer review. As a conclusion, we will compare the strategies of TSR’s founder with those of other researchers who - at some point in their career - have attempted to reorient their scientific trajectory, which in turn reveals the social conditions of these bifurcations that put previously accumulated scientific capital at risk.

Keywords: 7 Sexes, Analysis, Bibliometric, Bibliometric Analysis, Bifurcation, Clusters, Diffusion, Field, Fine-Structure Constant, Fractal Space-Time, Galaxies, Gravitational Lenses, Innovation, Laurent Nottale, Marginal Science, Peer Review, Peer-Review, Physics, Publication, Quantization, Quantum-Mechanics, Researchers, Scale Relativity, Science, Scientific Controversy, Scientific Field, Sociology of Science, Superstrings, Theory

? Godin, B. (2009), The value of science: Changing conceptions of scientific productivity, 1869 to circa 1970. *Social Science Information Sur les Sciences Sociales*, **48** (4), 547-586.

Full Text: [2009\Soc Sci Inf Sci Soc48, 547.pdf](2009/Soc%20Sci%20Inf%20Sci%20Soc48,%20547.pdf)

Abstract: Productivity is now a buzzword in science studies. Whether you consult the literature on research management, the economic literature on technology and innovation, the literature on bibliometrics or the official literature on science policy and its conceptual frameworks, what you find is analyses on productivity, often accompanied by a plea, and recipes, for increased productivity. This article documents how the concept of productivity got into the analysis of science, through the statistics on which the concept rested, and its transformation over one hundred years. It argues that, through history, the concept as applied to science has carried four meanings: productivity as reproduction, productivity as output, productivity as efficiency and productivity as outcome.

Keywords: Age, American-Psychological-Association, Bibliometrics, Economic-Growth, Economics of Science, History of Science, Men, Organization, Performance, Rates, Research, Return, Scientific Productivity, Statistics, United-States, Vital-Statistics

# Title: Social Science Information Studies

Full Journal Title: [Social Science Information Studies](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7256&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=c133a705c36f327ddc8ca5cdf6fb8111)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Roberts, S.A. and Chak, M. (1981), Size, growth and characteristics of the serial literature of geography. *Social Science Information Studies*, **1** (5), 317-338.

Full Text: [S\Soc Sci Inf Stu1, 317.pdf](S/Soc%20Sci%20Inf%20Stu1,%20317.pdf)

Abstract: This paper summarizes the findings of a detailed study of the serial literature of geography using the *International List of Geographical Serials (ILGS)* as the data base. In 1970 there were some 640 active primary titles published, together with another 500 or more currently appearing in a variety of forms on a less regular basis. Data are provided on the geographical and linguistic distribution of titles, as well as on form of publication, frequency of issue and issuing body. Between 1945 and 1970 the growth rate for all serial titles was 4.5 per cent per year. Mortality and longevity rates are discussed as well as the evidence for changes in characteristics over time. Some comparisons are made with other social science subjects. Some data are presented on the structure of the secondary bibliographical literature. In conclusion some comments on bibliometric data and subject documentation patterns are offered, by way of critical interpretation.

Hay, A. (1985), Some differences in citation between articles based on thesis work and those written by established researchers: Human geography in the UK 1974–1984. *Social Science Information Studies*, **5** (2), 81-85.

Full Text: [S\Soc Sci Inf Stu1, 81.pdf](S/Soc%20Sci%20Inf%20Stu1,%2081.pdf)

Abstract: The paper reports an investigation of citation (as recorded by *SSCI* in the five years after publication) for 209 articles in human geography published by British authors between 1974 and 1978.

Persson, O. (1985), Scandinavian social science in international journals. *Social Science Information Studies*, **5** (4), 185-190.

Full Text: [S\Soc Sci Inf Stu1, 185.pdf](S/Soc%20Sci%20Inf%20Stu1,%20185.pdf)

Abstract: The publication of articles by Scandinavian authors is analysed using the *Social Science Citation Index*. An online search in *SSCI* revealed a stagnation of article production from the Scandinavian countries during the late 1970s. This may be due to an increase of applied research, financed by non-traditional research councils. Economics is the discipline that produces the largest number of articles in non-Scandinavian journals. Sociology is much more oriented to a Scandinavian public. There is also a tendency that Scandinavian journals, even when they are in English, are mainly cited by other Nordic periodicals. These data suggest that measures should be taken to stimulate basic research and international diffusion of Scandinavian social science research.

# Title: Social Science Journal

Full Journal Title: [Social Science Journal](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6588&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=3c54b12c4c65e20476b5da8132db62f4)

ISO Abbrev. Title: Soc. Sci. J.

JCR Abbrev. Title: SOC SCI J

ISSN: 0362-3319

Issues/Year: 4

Language: English

Journal Country/Territory: Netherlands

Publisher: Elsevier Science BV

Publisher Address: Po Box 211, 1000 Ae Amsterdam, Netherlands

Subject Categories:

Social Sciences, Interdisciplinary: Impact Factor 0.253, 58/68 (2009)

Michaels, J.W. and Pippert, J.M. (1986), *Social Science Journal* characteristics and journal citation measures. *Social Science Journal*, **23** (1), 33-42.

Full Text: [S\Soc Sci J23, 33.pdf](S/Soc%20Sci%20J23,%2033.pdf)

Abstract: This article examines the relationship between structural characteristics of journals and journal citation measures. Journals listed in the *Social Science Citation Index* were found to differ from unlisted journals on 11 of 18 characteristics. For listed journals, journal characteristics accounted for 58 percent of the variance in 1981 citations to all years, but only 33 and 15 percent respectively of the variances in the more restrictive impact factor and immediacy index measures. The effects of several journal characteristics on citations to all years and impact factor were different for journals sponsored by professional associations compared to other journals. Journal characteristics identified as having independent impacts on citation measures are suggestive of the directions journal editors might choose to move in as their journals mature.

Hoaas, D.J. and Madigan, L.J. (1999), A citation analysis of economists in principles of economics textbooks. *Social Science Journal*, **36** (3), 525-532.

Full Text: [S\Soc Sci J36, 525.pdf](S/Soc%20Sci%20J36,%20525.pdf)

Abstract: This paper uses citation analysis to identify those economists from the history of economic thought most often referenced in principles of economics textbooks. The textbooks considered for the study represent 10 of the top-selling principles textbooks in the field. The analysis includes a simple page count of the number of citations an economist receives in principles texts and a more thorough discussion of each specific economist’s contributions. The results generated mirror the results of previous citation analysis conducted on the entire field of economics.

# Title: Social Science & Medicine

Full Journal Title: [Social Science & Medicine](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5925&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=a114123cc12a8b8a3c98f798ff059aa8&chunk=19#19)

ISO Abbreviated Title: Soc. Sci. Med.

JCR Abbreviated Title: Soc Sci Med

ISSN: 0277-9536

Issues/Year: 24

Journal Country England

Language: Multi-Language

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Public, Environmental & Occupational Health: Impact Factor 1.691, / (2000)

Social Sciences, Biomedical: Impact Factor 1.691, / (2000)

Brodsky, H. and Hakkert, A.S. (1983), Highway fatal accidents and accessibility of emergency medical services. *Social Science & Medicine*, **17** (11), 731-740.

Full Text: [S\Soc Sci Med17, 731.pdf](S/Soc%20Sci%20Med17,%20731.pdf)

Abstract: Medical estimates of potentially ‘salvageable’ lives with better emergency medical services (EMS) in fatal highway crashes have generally been around 20%. In rural counties in Texas, however, our statistical results show that at least 38% of fatal accidents could have been nonfatal. This higher figure may reflect the extreme contrasts in EMS accessibility that exist in certain rural areas. Accident related variables that would have affected our results were controlled by log linear analysis. Better ‘quality’ EMS in rural Texas would, apparently, save lives, but to insure cost-effectiveness more needs to be learned about the impact of various components of EMS: notification time, ambulance response and hospital care.

Colquhoun, J. (1984), New evidence on fluoridation. *Social Science & Medicine*, **19** (11), 1239-1246.

Full Text: [S\Soc Sci Med19, 1239.pdf](S/Soc%20Sci%20Med19,%201239.pdf)

Dunning, J.M. (1984), New evidence on fluoridation: Commentary. *Social Science & Medicine*, **19** (11), 1244-1246.

Full Text: [S\Soc Sci Med19, 1244.pdf](S/Soc%20Sci%20Med19,%201244.pdf)

Colquhoun, J. (1984), New evidence on fluoridation: Rejoinder. *Social Science & Medicine*, **19** (11), 1246.

Full Text: [S\Soc Sci Med19, 1246.pdf](S/Soc%20Sci%20Med19,%201246.pdf)

Dodge, C.P. (1990), Health implications of war in Uganda and Sudan. *Social Science & Medicine*, **31** (6), 691-698.

Full Text: [S\Soc Sci Med31, 691.pdf](S/Soc%20Sci%20Med31,%20691.pdf)

Abstract: Civil war disrupted agriculture and trade in Uganda and Sudan. This reduced tax revenues and drained scarce resources away from health budgets to finance increased military expenditures. Hundreds and thousands of people were driven from their homes either as internally displaced people or as refugees. Normal health service delivery systems were broken down forcing doctors, nurses and other health professionals into towns, cities or neighbouring countries in search of peace and employment. Scores of hospitals, health centres and dispensaries were abandoned, destroyed or looted, rendering even the limited physical facilities useless. Preventive public health services such as immunization and provision of potable drinking water were discontinued leaving huge populations susceptible to controllable infectious diseases and epidemics.

Hertz, E., Hebert, J.R. and Landon, J. (1994), Social and environmental factors and life expectancy, infant mortality, and maternal mortality rates: Results of a cross-national comparison. *Social Science & Medicine*, **39** (1), 105-114.

Full Text: [S\Soc Sci Med39, 105.pdf](S/Soc%20Sci%20Med39,%20105.pdf)

Abstract: Using data from United Nations sources we conducted an international comparison study of infant and maternal mortality rates and life expectancy at birth. We examined these three dependent variables in relation to a range of independent variables including dietary factors, medical resource availability, gross national product (GNP/capita), literacy rates, growth in the labor force, and provision of sanitation facilities and safe water. Based on exploratory stepwise regression models, we fitted a series of general linear models for each of the three dependent variables. For the models with the highest explanatory ability, the percent of households without sanitation facilities showed the strongest association with all three dependent variables: life expectancy at birth (R2 = 0.83, B =-0.088, P = 0.0007), infant mortality rate (R2 = 0.87, B = +0.611, P < 0.0001), and maternal mortality rate (R2 = 0.54, B = +8.297, P = 0.002). Additional significant predictors of life expectancy at birth and infant mortality rate included the quantity of animal products consumed, the percent of households without safe water, excess calories consumed as fat, and the total literacy level. Maternal mortality rate was significantly associated with total energy consumption and excess energy consumed as fat. Using residuals from the general linear models we chose three outlying countries: Costa Rica, Sri Lanka and Egypt, on which to do case studies. These country case studies are discussed briefly in regard to characteristics that could account for their differing statistical relationships.

? Skolbekken, J.A. (1995), The risk epidemic in medical journals. *Social Science & Medicine*, **40** (3), 291-305.

Full Text: [1995\Soc Sci Med40, 291.pdf](1995/Soc%20Sci%20Med40,%20291.pdf)

Abstract: Searches in MEDLINE databases show a rapid increase in the number of articles with the term ‘risk(s)’ in the title and/or abstract in the period from 1967 to 1991. This trend is found in medical journals giving a general coverage of medicine and journals covering obstetrics and gynaecology in U.S.A., Britain and Scandinavia. The most rapid increase is, however, found in epidemiological journals. Comparisons of the developments in the occurrence of such terms as risk, hazard, danger and uncertainty show that the increasing frequency of the term risk in the medical literature can not be explained as a change in terminology alone. It is hypothesized that the ongoing trend, which resembles an epidemic, is a result of developments in science and technology, that has changed our beliefs about the locus of control from factors outside human control to factors inside our control. The origins of the epidemic may be traced to the development of such disciplines as probability statistics, increased focus on risk management and health promotion, with recent developments in computer technology as the factor responsible for the escalation seen in the past decade. With the cultural selection of risks in mind, the social construction of risk is discussed. Potentially harmful effects of such an epidemic are discussed, exemplified through controversies over current epidemiological risk construction and strategies for coronary risk reduction. It is finally argued that the risk epidemic reflects the social constructions of a particular culture at a particular time in history.

Keywords: Britain, Construction, Control, Coverage, Cultural, Culture, Databases, Development, Epidemic, General, Gynaecology, Hazard, Health, Health Promotion, History, Human, Journals, Literature, Locus of Control, Management, Medical, Medical Journals, Medical Literature, Medicine, Medline, Obstetrics, Promotion, Reduction, Risk, Risk Management, Risks, Science, Science and Technology, Social, Statistics, Technology, Term, Terminology, Trend, Uncertainty

Notes: highly cited

? Ong, L.M.L., Dehaes, J.C.J.M., Hoos, A.M. and Lammes, F.B. (1995), Doctor-patient communication - A review of the literature. *Social Science & Medicine*, **41** (7): 903-918.

Full Text: [1995\Soc Sci Med41, 903.pdf](1995/Soc%20Sci%20Med41,%20903.pdf)

Abstract: Communication can be seen as the main ingredient in medical care. In reviewing doctor-patient communication, the following topics are addressed: (1) different purposes of medical communication, (2) analysis of doctor-patient communication, (3) specific communicative behaviors, (4) the influence of communicative behaviors on patient outcomes, and (5) concluding remarks.

Three different purposes of communication are identified, namely: (a) creating a good inter-personal relationship, (b) exchanging information, and (c) making treatment-related decisions. Communication during medical encounters can be analyzed by using different interaction analysis systems (IAS). These systems differ with regard to their clinical relevance, observational strategy, reliability/validity and channels of communicative behavior. Several communicative behaviors that occur in consultations are discussed: instrumental (cure oriented) vs affective (care oriented) behavior, verbal vs non-verbal behavior, privacy behavior, high vs low controlling behavior, and medical vs everyday language vocabularies. Consequences of specific physician behaviors on certain patient outcomes, namely: satisfaction, compliance/adherence to treatment, recall and understanding of information, and health status/psychiatric morbidity are described. Finally, a framework relating background, process and outcome variables is presented.

Keywords: Doctor-Patient Communication, Purposes of Communication, Interaction Analysis Systems, Communicative Behaviors, Patient Outcomes, Early Breast-Cancer, Medical-Students, Bad-News, Nonverbal-Communication, Physician Attitudes, Information-Seeking, Interviewing Skills, Treatment Decisions, Chronic Disease, Satisfaction

Wang, L.F. and Huang, J.Z. (1995), Outline of control practice of endemic fluorosis in China. *Social Science & Medicine*, **41** (8), 1191-1195.

Full Text: [S\Soc Sci Med41, 1191.pdf](S/Soc%20Sci%20Med41,%201191.pdf)

Abstract: Endemic fluorosis is prevalent in China covering 29 provinces, municipalities and autonomous regions. The endemically affected areas can be divided, according to the sources of fluoride, into three types: high fluoride water, pollution from coal burning, and drinking brick tea in excess. Since the 1960’s, several pilot surveys of the disease have been made and control programmes carried out in some of the areas. An Expert Consultation Committee on Endemic Fluorosis Control of the Ministry of Public Health was formally established in 1979. A national survey programme and series of working criteria for the disease were drawn up at the First National Congress of Endemic Fluorosis Control in 1981. Under the Central Government of China, administrative organizations and institutions concerned at all levels have been set up, forming a nation-wide network of control. Cooperation and coordination among such departments as health, water conservancy, geology and finance have been achieved in the planning and implementation of control programmes. Since 1980, many projects for improving drinking water quality through de-fluoridation have been completed. At the same time, new methods and technologies for improving stove and grain baking have become widely used in some of the areas where environmental fluoride pollution exists from burning coal. After all the control programmes had been introduced, the incidence of the illness was reduced with some patients making a complete recovery.

Rogerson, R.J. (1995), Environmental and health-related quality of life: Conceptual and methodological similarities. *Social Science & Medicine*, **41** (10), 1373-1382.

Full Text: [S\Soc Sci Med41, 1373.pdf](S/Soc%20Sci%20Med41,%201373.pdf)

Abstract: The recent revival of interest in the concept of quality of life by academics in both the social and medical sciences and amongst politicians has focused attention on the continuing debate about the definition, measurement and utilisation of quality of life. In particular, the need amongst regulatory and financial authorities-both in the health sector and in local government-to know about the potential impact of intervention has encouraged further interest in the use of quality of life measures to assist resource allocation and assessing the impact of policy decisions. In this paper it is argued that whilst such measures may be the ultimate goal of research, this can only be constructed on a fuller understanding of quality of life measures of current conditions and the relationship between components of life quality. A conceptual framework is developed to show the relationship between the way that quality of life, in both environmental and health-related studies, has been conceived and measured. The strong similarities in both respects are discussed, pointing to the need for heightened interdisciplinary dissemination of research methods and assessments.

Keywords: Subjective Social-Indicators, Of-Life, Well, Deprivation, Glasgow, Cancer, Conceptualization, Quality of Life, Measurement, Environment

Clark, J.A., Wray, N., Brody, B., Ashton, C., Giesler, B. and Watkins, H. (1997), Dimensions of quality of life expressed by men treated for metastatic prostate cancer. *Social Science & Medicine*, **45** (8), 1299-1309.

Full Text: [S\Soc Sci Med45, 1299.pdf](S/Soc%20Sci%20Med45,%201299.pdf)

Abstract: Men who pursue active treatment for metastatic prostate cancer face a choice between medical or surgical castration. While both alternatives have documented side-effects (e.g. loss of libido, breast enlargement and tenderness, hot flashes, and nausea), their psychosocial impacts are not well understood. As part of a study of patients’ treatment decision making, we have sought to construct a patient-based measure of the salient disease and treatment-related qualities of life experienced by these men subsequent to treatment. Focus groups (15 with patients, two with wives) were used to develop candidate Likert scale questionnaire items representing quality of life issues that patients said were important. These items were combined with assessments of symptoms, comorbidity, and generic measures of functional status and well-being in a mail survey of patients treated at the Houston VAMC and two other Houston hospitals (n = 201, response rate = 63%). Psychometric analyses (principal components and multitrait scaling) were used to identify distinct dimensions of life quality, correlations with generic measures, and symptom reports were used in validation analyses. Qualitative analyses of focus group data identified three major domains of life quality: self-perceptions, anxiety about the effects of treatment, and concern with the process of decision making and treatment. Psychometric analyses identified nine reliable and valid indicators of prostate cancer-related quality of life: body image, sexual problems, spouse affection, spouse worry, masculinity, cancer-related self-image, cancer distress, cancer acceptance, and regret of treatment decision. Internal consistency (alpha) ranged from 0.71 to 0.90. Correlations with reference scales (e.g. MOS Mental Health Index, Profile of Mood States) and symptom status supported concurrent validity. Prostate cancer patients perceive a number of important psychosocial consequences of their treatment. These consequences are represented by nine scales comprising a brief (35 items) disease and treatment sensitive health-related quality of life instrument, which we will use in monitoring the outcomes of patients’ treatment choices. (C) 1997 Elsevier Science Ltd.

Keywords: Of-Life, Clinical-Trials, Patients Choice, End-Points, Buserelin, Carcinoma, Distress, Therapy, Health-Related Quality of Life, Prostate Cancer

Gulliford, M.C. and Mahabir, D. (1998), Social inequalities in morbidity from diabetes mellitus in public primary care clinics in Trinidad and Tobago. *Social Science & Medicine*, **46** (1), 137-144.

Full Text: [S\Soc Sci Med46, 137.pdf](S/Soc%20Sci%20Med46,%20137.pdf)

Abstract: Associations between socio-economic status and non-communicable diseases in middle income countries have received little study. We conducted an interview survey to evaluate the associations of morbidity with social conditions among people attending government primary care health centres with diabetes mellitus in Trinidad. Data collected included morbidity from hyperglycaemia, foot problems, visual problems and cardiovascular disease, as well as social and demographic variables. of 622 subjects, 35% were aged > or = 65 years, 54% were Indo-Trinidadian, 13% had no schooling, only 11% were in full-time employment, and 33% had no piped drinking water supply in the home. Prevalent symptoms included itching, reported by 215 (35%), nocturia in 315 (51%), burning or numbness in the feet in 350 (56%), and difficulty with eyesight in 363 (58%). A morbidity summary score was used as dependent variable in regression analyses. Comparing those with no schooling with those with secondary education, the mean difference in morbidity score was 1.77 (95% CI 1.15-2.39), attenuated to 0.71 (0.06-1.37) after adjusting for age, gender, ethnic group and diabetes duration. The equivalent differences for those with no piped water supply in the house, compared with those with, were 0.53 (0.17-0.88) and 0.57 (0.24-0.89). For the unemployed, compared with those in full-time jobs, at ages 15-59 years the differences were 0.85 (0.14-1.56) and 0.58 (-0.11-1.27). We conclude that morbidity in persons with diabetes is associated with indicators of lower socio-economic status and that this association is partly explained by confounding with older age, female gender, longer duration of diabetes and Indo-Trinidadian ethnic group. A negative association between socio-economic status and morbidity from diabetes contributes to a justification for investment of public health resources in the control of diabetes and other non-communicable diseases.

Cheung, Y.B. (1998), Accidents, assaults, and marital status. *Social Science & Medicine*, **47** (9), 1325-1329.

Full Text: [S\Soc Sci Med47, 1325.pdf](S/Soc%20Sci%20Med47,%201325.pdf)

Abstract: Marriage may reduce the risk of accidents and assaults by promoting social control of health behavior. This study examines the impact of marital status on non-fatal accidents and assaults in young British women. Data is drawn from a large cohort study of the people born in 1958. Rate ratios of overall and specific incidence of non-fatal accidents and assaults are determined by negative binomial regression, with adjustment for socio-economic and behavioral confounders. The null hypothesis of no association between marital status and incidence of non-fatal accidents and assaults is rejected. It is suggested that, independent of parental status, more exposure to marriage and less exposure to marital dissolution may reduce accidents and assaults. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Accidents, Assaults, Social Control, Marital Status, Britain, Social-Control, Health, Marriage, Family, Mortality, Behavior

Albrecht, G.L. and Devlieger, P.J. (1999), The disability paradox: High quality of life against all odds. *Social Science & Medicine*, **48** (8), 977-988.

Full Text: [S\Soc Sci Med48, 977.pdf](S/Soc%20Sci%20Med48,%20977.pdf)

Abstract: This paper builds on the work of Sol Levine to examine a disability paradox: Why do many people with serious and persistent disabilities report that they experience a good or excellent quality of life when to most external observers these individuals seem to live an undesirable daily existence? The paper uses a qualitative approach to develop an explanation of this paradox using semi-structured interviews with 153 persons with disabilities. 54.3% of the respondents with moderate to serious disabilities reported having an excellent or good quality of life confirming the existence of the disability paradox. Analysis of the interviews reveals that for both those who report that they have a good and those who say they have a poor quality of life, quality of life is dependent upon finding a balance between body, mind and spirit in the self and on establishing and maintaining an harmonious set of relationships within the person’s social context and external environment. A theoretical framework is developed to express these relationships. The findings are discussed for those with and without disabilities and directions are given for future research. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Of-Life, Health, Coherence, Pain, Attitudes, Sense, Disability, Quality of Life, Body, Mind, Spirituality

Koch, T. (2000), Life quality vs the ‘quality of life’: Assumptions underlying prospective quality of life instruments in health care planning. *Social Science & Medicine*, **51** (3), 419-427.

Full Text: [S\Soc Sci Med51, 419.pdf](S/Soc%20Sci%20Med51,%20419.pdf)

Abstract: Quality of Life is a broad construct used in health planning, health economics, and medical decision-making. It is also a term that has a long currency in social and sociological literatures. This paper considers the assumptions underlying prospective QL instruments in an historical and contemporary context. It argues that as a tool in health planning and in clinical decision making life quality as a measurement has its origins in the early eugenics literature and the social policies that derived from it in first North America, the primary focus of this paper, and later in Europe. Reference to narrative and social literatures, as well as those involving coping and adaptation, are then used to critique the assumptions underlying this class of QL instruments. It concludes that to the degree now current prospective instruments reflect a purely physical perspective of ‘disease burden’ irrespective of social conditions they create a context that works against life quality, and in some cases, the continuance of persons with physical differences. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Of-Life, Euthanasia, Disease, Disabilities, Providers, Genetics, People, Injury, Odds, ALS, DALYs, Disability, Eugenics, Euthanasia, HeaLYs, Quality of Life, QALYs

? Moncrieff, J. and Crawford, M.J. (2001), British psychiatry in the 20th century - observations from a psychiatric journal. *Social Science & Medicine*, **53** (3), 349-356.

Full Text: [2001\Soc Sci Med53, 349.pdf](2001/Soc%20Sci%20Med53,%20349.pdf)

Abstract: In order to investigate change and continuity in the concerns and practices of psychiatry in Britain during the 20th century we examined contents of the British Journal of Psychiatry. Specifically we sought to examine the paradigms used by psychiatry to conceptualise mental illness during this time. Back issues of the journal for 1 year at the mid-point of each decade were examined. We undertook a quantitative analysis categorising each article in terms of its form and content and a qualitative analysis in order to summarise the subjects that were covered. The results show that there has been continuous interest in biological aspects and treatments of mental illness with relatively little coverage of psychoanalysis or social psychiatry. Little support was found for the suggestion that major shifts have occurred in the explanatory paradigms used by psychiatry over the century. Modern interest in biological psychiatry is therefore not a new departure, but appears rather as the continuation of a long-standing inclination. The decline of the asylum-based system of care has been accompanied by a broadening in the scope of psychiatric concerns with a greater emphasis on milder mental disorders such as neurosis and depression. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Analysis, Biological, Britain, Care, Coverage, Depression, Journal, Mental Disorders, Mental Illness, Midpoint, Practices, Psychiatry, Qualitative, Qualitative Analysis, Quantitative Analysis, Rights, Scope, Social, Social Psychiatry, Support

? Keskimaki, I. (2003), How did Finland’s economic recession in the early 1990s affect socio-economic equity in the use of hospital care? *Social Science & Medicine*, **56** (7), 1517-1530.

Full Text: [2003\Soc Sci Med56, 1517.pdf](2003/Soc%20Sci%20Med56,%201517.pdf)

Abstract: The study evaluates the changes in socio-economic equity in the use of general hospital care in Finland from the late 1980s to the mid 1990s. In the early 1990s the Finnish economy plunged into a deep recession which slashed over 10% of GDP and resulted in a 12% decrease in national health expenditure. At the same time, the administration and financing of specialised health services were reformed. The impact on general hospital care was controversial: budgets were reduced but better productivity increased the supply of many services. According to the study, data, based on individual linkage of nationwide hospital registers to disposable family income data in population censuses, overall acute general hospital admission rates among Finns aged 25-74 increased by over 10% from 1988 to 1996. For some surgical procedures, such as cataract, coronary revascularisation and some orthopaedic operations, rates more than doubled. In both years, lower-income groups generally used hospital care more than the better-off. However, there was a slight shift towards a pro-rich distribution, mainly due to a larger increase in surgical care among the high-income groups. In 1988 the lowest income quintile used 8% and in 1996 15% fewer operations than the highest. For individual procedures and surgical diagnostic categories, the general trends of increasing disparities were similar. Despite cuts in expenditures in the early 1990s, the Finnish general hospital system based on public funding and provision managed to increase the supply of services. However, this increase coincided with widening socio-economic discrepancies in the use of surgical services. The paper proposes that these increasing inequities were due to certain features of the Finnish health care system which create social discrepancies in access to hospital care. These include the high profile of the private sector in specialised ambulatory care and in the supply of some elective procedures, and semi-private public hospital services requiring supplementary payments from patients.

Keywords: Economic Recession, Hospital Care, Surgical Procedures, Socio-Economic Equity, Income Groups, Finland, Health-Care, Inequalities

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Full Text: [2004\Soc Sci Med58, 577.pdf](2004/Soc%20Sci%20Med58,%20577.pdf)

Abstract: This study examines how Selective Serotonin Reuptake Inhibitor (SSRI) antidepressants have played a contributing role in expanding categories of women’s “mental illness” in relation to categories of “normal” behavior. We hypothesized that between 1985 and 2000, as Premenopausal Dysphoric Disorder (PMDD), postpartum depression, and perimenopausal depression were increasingly treated with SSRIs, popular categories of depressive illness expanded to encompass what were previously considered normative women’s life events such as motherhood, menstruation, or child birth. We quantified and qualified this expansion through an in-depth analysis of popular representations of depressive illness during the time period when SSRIs were introduced. Using established coding methods, we analyzed popular articles about depression from a mix of American magazines and newspapers spanning the years 1985-2000. Through this approach, we uncovered a widening set of gender-specific criteria outside of the Diagnostic and Statistical Manual criteria for dysthymic or depressive disorders that have, over time, been conceived as indicative of treatment with SSRIs. Our results suggest that SSRI discourse may have helped shift popular categories of “normal/acceptable” and “pathological/treatable” womanhood, in much the same way that the popularity of Ritalin has shifted these categories for childhood. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Approach, Behavior, Birth, Child, Childhood, Coding, Criteria, Depression, Discourse, Events, Gender-Specific, Impact, Life, Menstruation, Methods, Postpartum, Postpartum Depression, Rights, Role, Treatment

Weeks, W.B., Wallace, A.E. and Kimberly, B.C.S. (2004), Changes in authorship patterns in prestigious US medical journals. *Social Science & Medicine*, **59** (9), 1949-1954.

Full Text: [S\Soc Sci Med59, 1949.pdf](S/Soc%20Sci%20Med59,%201949.pdf)

Abstract: To improve identification of contributors to manuscripts, editors of medical journals have developed authorship responsibility criteria. Some have specified an acceptable number of authors per manuscript. We wanted to examine changes in patterns of authorship in the context of the development of these specifications. Therefore, we used a retrospective cohort design to calculate the average number of authors per manuscript and the prevalence of group and corporate authorship between 1980 and 2000 for original, scientific, non-serial articles published in four prestigious medical journals: the Annals of Internal Medicine, Archives of Internal Medicine, Journal of the American Medical Association, and the New England Journal of Medicine. Group authorship identifies individual authors in the byline who are writing for a group, in corporate authorship, contributors are not individually listed in the byline.

We found that the number of authors per article increased dramatically over time in each journal, from an average of 4.5 in 1980 to 6.9 in 2000 across journals. As a proportion of published manuscripts, group authorship (authors listed in the byline) increased from virtually zero to over 15%, while corporate authorship (authors not listed in the byline) remained rare and stagnant. Manuscripts published by single authors all but vanished. Group authorshi was most prevalent in journals that limited the acceptable number of authors per manuscript.

These findings suggest that the number of authors per manuscript continues to grow. The growth in the number of authors on bylines and the proportion of group-authored manuscripts is likely to reflect the increasing complexity of medical research.

Keywords: Academic Medicine, Publications

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Full Text: [2005\Soc Sci Med61, 731.pdf](2005/Soc%20Sci%20Med61,%20731.pdf)

Abstract: Controversies about biotechnologics often centre not so much on present scientific facts as on speculations about risks and benefits in the future. It is this key futuristic element in these arguments that is the focus of this article. We examine how competing visions of utopia or dystopia are defended through the use of diverse vocabularies, metaphors, associations and appeals to authority. Our case study explores how these rhetorical processes play out in the debate about embryo stem cell research in UK national press and TV news media. The findings show how predictions from those in favour of embryo stem cell research are supported by both hype and by anti-hype, by inconsistent appeals to the technologies’ innovative status and by the selective deconstruction of concepts such as ‘potential’ and ‘hope’. The debate also mobilises binary oppositions around reason versus emotion, science versus religion and fact versus fiction. This article highlights how traditional assertions of expertise are now combined with ideas about compassion and respect for democracy and diversity. It also highlights the fact that although news reporters are often responding to topical events the real focus is often on years, even decades ahead. Close attention to how images of the future are constructed, and the evolution of new strategies for legitimation are, we suggest, important areas of on-going research, particularly in discussions of scientific and medical developments and policy. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Case Study, Constructed, Democracy, Diversity, Embryo, Events, Evolution, Media, Medical, Policy, Potential, Predictions, Religion, Research, Rights, Risks, Science, Stem Cell, Technologies, Topical, UK, Visions

? Bastos, J.L., Celeste, R.K., Faerstein, E. and Barros, A.J.D. (2010), Racial discrimination and health: A systematic review of scales with a focus on their psychometric properties. *Social Science & Medicine*, **70** (7), 1091-1099.

Full Text: 2010\Soc Sci Med70, 1091.pdf

Abstract: The literature addressing the use of the race variable to study causes of racial inequities in health is characterized by a dense discussion on the pitfalls in interpreting statistical associations as causal relationships. In contrast, fewer studies have addressed the use of racial discrimination scales to estimate discrimination effects on health, and none of them provided a thorough assessment of the scales’ psychometric properties. Our aim was to systematically review self-reported racial discrimination scales to describe their development processes and to provide a synthesis of their psychometric properties. A computer-based search in PUBMED, LILACS, PsycInfo, Scielo, Scopus and Web of Science was conducted without any type of restriction, using search queries containing free and controlled vocabulary. After initially identifying 3060 references, 24 scales were included in the review. Despite the fact that discrimination stands as topic of international relevance, 23 (96%) scales were developed within the United States. Most studies (67%, N = 16) were published in the last 12 years, documenting initial attempts at scale development, with a dearth of investigations on scale refinements or cross-cultural adaptations. Psychometric properties were acceptable; sixteen of all scales presented reliability scores above 0.7, 19 out of 20 instruments confirmed at least 75% of all previously stated hypotheses regarding the constructs under consideration, and conceptual dimensional structure was supported by means of any type of factor analysis in 17 of 21 scales. However, independent researchers, apart from the original scale developers, have rarely examined such scales. The use of racial terminology and how it may influence self-reported experiences of discrimination has not yet been thoroughly examined. The need to consider other types of unfair treatment as concurrently important health-damaging exposures, and the idea of a universal instrument which would permit cross-cultural adaptations, should be discussed among researchers in this emerging field of inquiry. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: African-Americans, Analysis, Assessment, Blood-Pressure, Causality, Community, Development, Discrimination, Disparities, Factor-Analysis, Inventory, Literature, Perceived Ethnic Discrimination, Prejudice, Psychometrics, Pubmed, Questionnaires, Race, Race Relations, Racial Discrimination, Reliability, Researchers, Review, Science, Scopus, Self-Report, Statistical, Stress, Systematic, Systematic Review, Treatment, Validation, Web of Science

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Full Text: [2010\Soc Sci Med70, 1458.pdf](2010/Soc%20Sci%20Med70,%201458.pdf)

Keywords: Authorship, Health, Research

# Title: Social Science Quarterly

Full Journal Title: [Social Science Quarterly](http://weblinks3.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+pbhjnh+bt+ID++SSQ+101C&_ug=sid+A51803FD%2D883D%2D4153%2D8AC9%2DBAB79A72C842%40sessionmgr2+dbs+pbh+A340&_us=hd+True+sm+ES+4DBA&_uso=st%5B0+%2DID++SSQ+tg%5B0+%2D+db%5B0+%2Dpbh+op%5B0+)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0038-4941

Issues/Year:

Journal Country

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

Christenson, J.A. and Sigelman, L. (1985), Accrediting knowledge: Journal stature and citation impact in social-science. *Social Science Quarterly*, **66** (4), 964-975.

Full Text: [S\Soc Sci Qua66, 964.pdf](S/Soc%20Sci%20Qua66,%20964.pdf)

# Title: Social Studies of Science

Full Journal Title: [Social Studies of Science](http://www.jstor.org/action/showPublication?journalCode=socistudscie)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0306-3127

Issues/Year:

Journal Country

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [1960-80\Soc Stu Sci5, 86.pdf](1960-80/Soc%20Stu%20Sci5,%2086.pdf)

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Full Text: [1960-80\Soc Stu Sci5, 423.pdf](1960-80/Soc%20Stu%20Sci5,%20423.pdf)

? Spiegelrosing, I. (1977), Science studies - Bibliometric and content-analysis. *Social Studies of Science*, **7** (1), 97-113.

Full Text: [1960-80\Soc Stu Sci7, 97.pdf](1960-80/Soc%20Stu%20Sci7,%2097.pdf)

Abstract: The paper evaluates the first four volumes of the journal Science Studies (now Social Studies of Science) with bibliometric and content analysis methods. The analyses refer to four major areas of characterization of the journal’s articles: 1. Emphasis and balance with respect to their objects and methods of analysis, 2. The range of validity of their results in terms of (a) the disciplines covered, (b) the time period investigated, and (c) the country to which the data or discussions refer, 3. Several quantitative and qualitative analyses of previous research taken into account, and 4. A content analysis of their self-legitimating language.

Keywords: Bibliometric, Science

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Full Text: [1960-80\Soc Stu Sci7, 167.pdf](1960-80/Soc%20Stu%20Sci7,%20167.pdf)

Abstract: An analysis is presented of article production, demography, and referencing patterns for the period 1950-72 in a specialty within elementary particle physics: the physics of weak interactions. Special attention is paid to differences between theorists and experimentalists and to the impact on article production, demography, and referencing patterns of three major intellectual events (parity violation, the emergence of V-A theory, and CP nonconservation) which occurred during the period under study. Patterns of article production were shown to be quite different for theorists and experimentalists while demographic and referencing patterns were seen often to be similar. The increasing complexity of experimental research technology is suggested as the explanation for the differences in patterns of article production for theory and experiment. The effects of the three major intellectual events are visible in most of the graphs presented. Parity and CP were events which perturbed the system, while the emergence of V-A theory returned the system to normalcy after the discovery of parity violation.

Notes: highly cited

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Full Text: [1960-80\Soc Stu Sci8, 327.pdf](1960-80/Soc%20Stu%20Sci8,%20327.pdf)

Abstract: An interpretation of citation practice in scientific literature is offered which regards citation of a document as an act of symbol usage. By examining the language of the text around the footnote number the particular idea the citing author is associating with the cited document may be determined: the document is viewed as symbolic of the idea expressed in the text. This analysis was done for a sample of very highly cited documents in chemistry. A high degree of uniformity is revealed in the association of specific concepts with specific documents. These documents may be seen, in Leach’s terms, as ‘standard sym- bols’ for particular ideas, methods, and experimental data in chemical science. Some implications of these findings for the social determination of scientific knowledge (conceived as a dialogue among citing authors on the ‘meaning’ of earlier texts), and the relationship between cited documents as concept symbols and Kuhn’s exemplars, are discussed.

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Full Text: [1960-80\Soc Stu Sci9, 481.pdf](1960-80/Soc%20Stu%20Sci9,%20481.pdf)

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Full Text: [1982\Soc Stu Sci12, 73.pdf](1982/Soc%20Stu%20Sci12,%2073.pdf)

Abstract: Drawing a distinction between the micro-level process of theory choice and the macro-level process of theory selection within science, this paper presents an analysis of the development of the weak-electromagnetic unification programme within the specialty of weak interactions in high energy physics. Bibliometric techniques are used to understand the process of theory selection during the rapid interaction of new theoretical and empirical developments. Employing an evolutionary analogy, the interplay of theory and experiment is analyzed during the theory selection process in the context of the history of the specialty. From this perspective, theory and experiment are seen to be closely dependent, as theorists depend heavily on experimental results for both the construction and confirmation of models, while at the same time experimental work depends on theory for understanding the relevance of results.

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Full Text: [1982\Soc Stu Sci12, 443.pdf](1982/Soc%20Stu%20Sci12,%20443.pdf)

Abstrct: This Note examines the data base used by Lotka in propounding his Law, and by Price in elaborating it, and questions the validity of the generalizations drawn from it.

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Full Text: [1985\Soc Stu Sci15, 127.pdf](1985/Soc%20Stu%20Sci15,%20127.pdf)

Abstract: Classical analyses of differences among the sciences have measured social but not cognitive structure. This paper suggests a method for describing differences among fields in the processes of knowledge growth. The method examines closely what is said about a particular scientific paper when it is cited in later works, and traces changes over time, if they occur. A comparative analysis of cases drawn from neuropharmacology and the sociology of science is used to illustrate the approach. The two papers analyzed show strong differences in the level of generality at which the contents of the original papers are cited. Lack of change over time in how the sociology of science paper is cited is attributed to the lack of attention to its main empirical knowledge claim.

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Full Text: [1985\Soc Stu Sci15, 558.pdf](1985/Soc%20Stu%20Sci15,%20558.pdf)

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Full Text: [S\Soc Stu Sci17, 569.pdf](S/Soc%20Stu%20Sci17,%20569.pdf)

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Full Text: [1988\Soc Stu Sci18, 375.pdf](1988/Soc%20Stu%20Sci18,%20375.pdf)

Keywords: Bibliometric, Modeling

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Full Text: [S\Soc Stu Sci23, 342.pdf](S/Soc%20Stu%20Sci23,%20342.pdf)

Abstract: A set of 316 commentaries by authors of highly-cited papers was reviewed, to identify any difficulty encountered by the authors in producing or publishing their articles. The commentaries were selected from those published each week in the Citation Classic(R) feature of Current Contents. According to their commentaries, a small proportion (5.7%) of the authors of these papers had some difficulty when doing the research, or when trying to publish the results. Three more highly-cited papers which had also encountered difficulties in getting published were identified from Citation Classic(R) commentaries: one of them was co-authored by a Nobel Prize winner. Three of the papers which encountered publication problems are the most cited from their respective journals. In part, the problematic papers reported innovative methods or theories, or presented new interpretations of previous data. Those in the peer review system should have access to these findings, to improve their review of innovative work. Evaluative criteria that are too narrow can sometimes lead to the initial rejection of very important papers.

Keywords: Reliability, Manuscript, Journals, Referees

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Full Text: [1993\Soc Stu Sci23, 571.pdf](1993/Soc%20Stu%20Sci23,%20571.pdf)

Abstract: The journal Scientometrics (and the research field it represents) has moved slightly from the ‘soft’ towards the ‘harder’ sciences. This proposition has been tested and supported by analyzing the references of the research articles published in the journal in the periods 1980-81 and 1990-91, respectively.

Keywords: 1980s, Field, Journal, References, Research, Sciences, Scientometrics

? Baldi, S. and Hargens, L.L. (1997), Re-examining Price’s conjectures on the structure of reference networks: Results from the special relativity, spatial diffusion modeling and role analysis literatures. *Social Studies of Science*, **27** (4), 669-687.

Full Text: [1997\Soc Stu Sci27, 669.pdf](1997/Soc%20Stu%20Sci27,%20669.pdf)

Abstract: In his influential article ‘Networks of Scientific Papers’, Derek Price used data on the N-rays reference network to exemplify his argument that natural science research literatures overcite recently published papers. In subsequent work, he further argued that this tendency is weaker in social science literatures, and may be entirely absent in scholarly literatures in the humanities. We report results from a replication of Price’s N-rays analysis and data for three additional reference networks: special relativity theory, spatial diffusion modeling and role algebra analysis. Our analyses indicate that the N-rays reference network provides little support for Price’s conjectures, but that those for the other three areas are generally consistent with them. We find, however, that the two social science literatures exhibit structures more closely resembling the pattern that Price claimed to be characteristic of the humanities, and suggest that the variety of structures that reference networks exhibit may be greater than Price anticipated.

Keywords: Analysis, Diffusion, Modeling, Network, Networks, Research, Science, Sciences, Self-Citations

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Full Text: [2007\Soc Stu Sci37, 691.pdf](2007/Soc%20Stu%20Sci37,%20691.pdf)

Abstract: In 1906, James McKeen Cattell, editor of Science, published a directory of men of science. American Men of Science was a collection of biographical sketches of thousands of men of science in the USA and was published periodically. It launched, and was used in, the very first systematic quantitative studies on science. Cattell used two concepts for his statistics: productivity, defined as the number of men of science a nation produces, and performance or merit, defined as scientific contributions to research as judged by peers. These are the two dimensions that still define measurement of scientific productivity today: quantity and quality. This paper analyzes the emergence of statistics on science and the very first uses to which they were put. It argues that the measurement of science emerged out of interest in great men, heredity and eugenics, and the contribution of eminent men to civilization. Among these eminent men were men of science, the population of whom was thought to be in decline and insufficiently appreciated and supported. Statistics on men of science thus came to be collected to document the case, and to contribute to the advancement of science and the scientific profession.

Keywords: Academy, American, American Men, Civilization, Collection, Contribution, Emergence, Eugenics, First, Heredity, James Mckeen Cattell, Measurement, Men, Men of Science, Performance, Population, Productivity, Profession, Quality, Rankings, Research, Science, Scientific Productivity, Scientometrics, Society, Statistics, Statistics on Science, Systematic, University Control, USA, Vital-Statistics

? Klenk, N.L., Hickey, G.M. and MacLellan, J.I. (2010), Evaluating the social capital accrued in large research networks: The case of the Sustainable Forest Management Network (1995-2009). *Social Studies of Science*, **40** (6), 931-960.

Full Text: [2010\Soc Stu Sci40, 931.pdf](2010/Soc%20Stu%20Sci40,%20931.pdf)

Abstract: This paper examines the social capital that evolved in the Sustainable Forest Management Network (SFMN), one of the Canadian Networks of Centres of Excellence. Our longitudinal study shows a sevenfold increase in the total number of researchers and a high density of relationships among (researchers from) provinces across the country. The results of a social network analysis revealed that 52.6 percent of the network researchers maintained the same number of collaborators while 46.7 percent increased their number of collaborators enormously: the maximum increase in number of collaborators being 6900 percent and the minimum 6 percent. A bibliometric analysis suggested that the number of publications was strongly correlated to measures of social capital. From a science and innovation policy perspective, the finding that more than half of the researchers in the SFMN did not increase their personal networks of collaborators raises important questions. A theoretical model is proposed to examine whether funding agencies should focus on fostering various network structures and evolutions or rely on competition in the distribution of research funds through networks. The proposed model is designed to measure the impact of various network structures on the development of social capital and research output.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Collaboration, Density, Development, Dynamics, Impact, Industry, Innovation, Innovation, Management, Model, Network, Networks, Number of Publications, Output, Productivity, Publications, Research, Research Collaboration, Research Output, Research-and-Development, Researchers, Science, Science Policy, Scientific Co-Authorship, Self-Organization, Small-World Problem, Social Capital, Social Network Analysis, Structural Holes, Sustainable

# Title: Social Work Research & Abstracts

Full Journal Title: Social Work Research & Abstracts

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Macroberts, M.H. and Macroberts, B.R. (1992), Problems of citation analysis. *Social Work Research & Abstracts*, **28** (4), 4.

Full Text: Soc Wor Res Abs28, 4.pdf

Keywords: DEC, Discourse, Science

? Baker, D.R. (1992), Problems of citation analysis - Reply. *Social Work Research & Abstracts*, **28** (4), 4-5.

Full Text: Soc Wor Res Abs28, 4-5.pdf

Keywords: DEC

# Title: Social Work in Health Care

Full Journal Title: [Social Work in Health Care](http://rsw.sagepub.com/archive/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0098-1389

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Holden, G., Rosenberg, G. and Barker, K. (2005), Tracing thought through time and space: A selective review of bibliometrics in social work. *Social Work in Health Care*, **41** (3-4), 1-34.

Full Text: [2005\Soc Wor Hea Car41, 1.pdf](2005/Soc%20Wor%20Hea%20Car41,%201.pdf)

Abstract: Bibliometrics is a field of research that examines bodies of knowledge within and across disciplines. Citation analysis, a component of bibliometrics, focuses on the quantitative assessment of citation patterns within a body of literature. Citation analysis has been used in social work to examine the quantity and the impact of the work of individuals and academic institutions. This paper presents a selective review of these uses of bibliometrics within social work.

Keywords: Academic, Academic Affiliations, Analysis, Assessment, Bibliometrics, Bodies, Citation, Citation Analysis, Citation Analysis, Citation Patterns, Consulting Editors, Editor-in-Chief, Editorial-Board Members, Faculty Publications, Field, Impact, Impact Factors, Informetrics, Institutions, Knowledge, Literature, Multiple Authorship, Publication Productivity, Research, Review, Scholarly Productivity, Scientometrics, Social, Social Work, Social Work Education, Social-Work, Sociology of Science, Space, Time, Work

? Rosenberg, G., Holden, G. and Barker, K. (2005), What happens to our ideas? A bibliometric analysis of articles in *Social Work in Health Care* in the 1990s. *Social Work in Health Care*, **41** (3-4), 35-66.

Full Text: [2005\Soc Wor Hea Car41, 35.pdf](2005/Soc%20Wor%20Hea%20Car41,%2035.pdf)

Abstract: Scholars spend a considerable amount of time reflecting upon their professional work. When individuals decide to communicate their professional thoughts beyond informal venues, the penultimate expression of their reflection is the peer reviewed journal article. The Study reported here entailed a bibliometric analysis of articles appearing in the journal Social Work in Health Care during the 1990s, in order to better understand what happens to our ideas after they appear in a peer reviewed journal article.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometrics, Citation Analysis, Citation Analysis, Decision-Making, Editorial-Board, Expression, Impact Factors, Informal, Informetrics, Journal, Journal Article, Journals, Multiple Authorship, Peer, Peer-Reviewed, Professional, Professional Work, Publication Productivity, Quality, Reflection, Scholarly Productivity, Scholarship, Science, Scientometrics, Social Work in Health Care, Social Work Journals, Sociology of Science, Time, Work

? Holden, G., Rosenberg, G. and Barker, K. (2005), Bibliometrics: A potential decision making aid in hiring, reappointment, tenure and promotion decisions. *Social Work in Health Care*, **41** (3-4), 67-92.

Full Text: [2005\Soc Wor Hea Car41, 67.pdf](2005/Soc%20Wor%20Hea%20Car41,%2067.pdf)

Abstract: The assessment of scholarship assumes a central role in the evaluation of individual faculty, educational programs and academic fields. Because the production and assessment of scholarship is so central to the faculty role, it is incumbent upon decision makers to strive to make assessments of scholarship fair and equitable. This paper will focus on an approach to the assessment of the quantity and impact of the most important Subset of an individual’s scholarship-peer-reviewed journal articles. The primary goal of this paper is to stimulate discussion regarding scholarship assessment in hiring, reappointment, tenure and promotion decisions.

Keywords: Academic, Approach, Assessment, Assessments, Bibliometric, Bibliometrics, Citation Analysis, Citation Analysis, Community-Service, Decision, Decision Making, Decision-Making, Decisions, Doctoral Programs, Evaluation, Faculty, Faculty, Hiring, Impact, Impact Factors, Informetrics, Journal, Journal Articles, Multiple Authorship, Potential, Primary, Production, Promotion, Publication Productivity, Reappointment, Role, Scholarly Productivity, Scholarship, Scientometrics, Self-Efficacy, Social Work Education, Social-Work Journals, Sociology of Science, Tenure, Tenure and Promotion Decisions

? Epstein, I. (2005), Following in the footnotes of giants: Citation analysis and its discontents. *Social Work in Health Care*, **41** (3-4), 93-101.

Full Text: [2005\Soc Wor Hea Car41, 93.pdf](2005/Soc%20Wor%20Hea%20Car41,%2093.pdf)

Abstract: Reflecting on his own personal history with bibliometrics, the author places it in the broader context of research with available information and data-mining. In so doing, he considers the utility of bibliometrics for raising new questions and its limitations for guiding decision-making.

Keywords: Available Information, Bibliometrics, Data-Mining

? Green, R.G. (2005), The paradox of faculty publications in professional journals. *Social Work in Health Care*, **41** (3-4), 103-108.

Full Text: [2005\Soc Wor Hea Car41, 103.pdf](2005/Soc%20Wor%20Hea%20Car41,%20103.pdf)

Abstract: The author reviews the companion papers about bibliometrics prepared for this Volume and concludes that each makes a unique contribution to the growth of scholarship within the profession. However, a major practical limitation of the system advocated by the authors of these papers for faculty in schools of social work is also identified. Because only a limited number of social work faculty members produce the Volume of articles required by the proposed system, the proposed system can be used Currently by only a small number of schools and departments of social work.

Keywords: Bibliometrics, Evaluating Scholarship, Faculty, Faculty Publication, Publications, Scholarship

? Kirk, S.A. (2005), Politics of personnel and landscapes of knowledge. *Social Work in Health Care*, **41** (3-4), 109-116.

Full Text: [2005\Soc Wor Hea Car41, 109.pdf](2005/Soc%20Wor%20Hea%20Car41,%20109.pdf)

Abstract: This is a commentary on three articles on bibliometrics in social work that appear in this volume. I argue that bibliometrics call make many contributions to the study of the structure and evolution of social work’s knowledge base, but it cannot completely remove subjectivity in the evaluation of the scholarship of individual faculty, where legitimate differences of professional opinion will remain.

Keywords: Bibliometrics, Citaton Analysis, Evaluation, Faculty, Faculty Evaluation, Knowledge Base, Scholarship

? Klein, W.C. and Bloom, M. (2005), Bibliometrics: The best available information? *Social Work in Health Care*, **41** (3-4), 117-121.

Full Text: [2005\Soc Wor Hea Car41, 117.pdf](2005/Soc%20Wor%20Hea%20Car41,%20117.pdf)

Abstract: This commentary raises significant cautions related to inherent shortcomings in the use of bibliographic analytic technology, and in particular its use in Substantive decision making around promotion and tenure. Questions are raised concerning the continued use of scholarly energy for bibliometric analysis Of Subtly different settings. The recommendation is offered that future efforts in bibliometrics Must target methods to reduce methodological shortcomings. These include clarifying the metric used to ‘Count’ sole, multiple authorship, and to evaluate the ‘merit’ of manuscripts as well as journals in which they appear. Finally, the fundamental meaning of the information produced in these analyses (i.e., the validity of the measure) must be clearly presented in order for it to be credibly used.

Keywords: Analysis, Authorship, Bibliometric, Bibliometric Analysis, Bibliometrics, Citation Analysis, Decision Making, Decision-Making, Energy, Information, Meaning, Methods, Promotion, Promotion And Tenure, Tenure, Validity

? Ligon, J. and Thyer, B.A. (2005), Bibliometrics and social work: A two-edged sword can still be a blunt instrument. *Social Work in Health Care*, **41** (3-4), 123-128.

Full Text: [2005\Soc Wor Hea Car41, 123.pdf](2005/Soc%20Wor%20Hea%20Car41,%20123.pdf)

Abstract: In order to improve the productivity and impact of social work scholarship, the profession must look beyond bibliometrics to other issues that Must be considered. These include the lag time between acceptance and publication of articles, the quality of peer review experienced by social work authors, and the overabundance of journals being published in social work.

Keywords: Affiliation, Bibliometrics, Citation Analysis, Criminal-Justice, Gender, Institutional Productivity, Journals, Peer Reviewed Journals, Publication, Scholarly Productivity, Scholarship, Social Work Authors, Social Work Scholarship, Textbooks

? Holden, G., Rosenberg, G. and Barker, K. (2005), Shallow science or meta-cognitive insights: A few thoughts on reflection via bibliometrics. *Social Work in Health Care*, **41** (3-4), 129-148.

Full Text: [2005\Soc Wor Hea Car41, 129.pdf](2005/Soc%20Wor%20Hea%20Car41,%20129.pdf)

Abstract: The authors conclude this Volume by responding to the commentaries of their colleagues and reviewing relevant scholarship that appeared in the bibliometric literature since their literature reviews for the initial three articles in this issue were completed. They conclude, in part, that examination of bibliometric data regarding the entry of an article into the profession’s knowledge base, and its ongoing life therein, may provide insights about the scientific communication process that lead to improvements of that process.

Keywords: Achievement Levels, Author Self-Citations, Authors, Bibliometric, Bibliometrics, Citation Analysis, Communication, Consulting Editors, Data, Decision-Making, Editorial-Board Members, Entry, Examination, Faculty, Faculty, Informetrics, Knowledge, Knowledge Base, Lead, Life, Literature, Process, Promotion, Psychology Journals, Publication, Reflection, Reviews, Scholarly Productivity, Scholarship, Science, Scientific Communication, Sciento-Metrics, Social-Work Journals, Sociology of Science, Tenure

? Natale, A.P. and Baker, D. (2010), HIV/AIDS scholarship: An analysis of groundbreaking programs and individuals. *Social Work in Health Care*, **49** (7), 669-686.

Full Text: [2010\Soc Wor Hea Car49, 669.pdf](2010/Soc%20Wor%20Hea%20Car49,%20669.pdf)

Abstract: The authors report on a bibliometric study of human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) scholarship among scholars in schools of social work in the United States. A sample of these HIV/AIDS scholars were accumulated from the faculty interest pages at social work programs accredited by the Council on Social Work Education. From this sample, the publication records, including citations, were examined and those individuals meeting the operational definition of oscholaro were ranked in the final analysis. Social work institutions are also ranked in terms of productivity and impact. Last, the journal outlets that publish the work of social work HIV/AIDS scholars are ranked by publication productivity. The article concludes with a discussion of the strengths and limitations of the method used and future research directions.

Keywords: Academic Affiliations, AIDS, Articles, Bibliometric, Bibliometrics, Citation Analysis, Faculty Publications, HIV, Impact, Journals, Moratorium, Publication, Publication Productivity, Rank Schools, Research, Scholarship, Science, Social Work, Social-Work Journals

# Title: Society of Petroleum Engineers Journal

Full Journal Title: Society of Petroleum Engineers Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0197-7520

Issues/Year:

Journal Country

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

? Lake, L.W. and Helfferich, F. (1978), Cation-exchange in chemical flooding. 2. Effect of dispersion, cation-exchange, and polymer-surfactant adsorption on chemical flood environment. *Society of Petroleum Engineers Journal*, **18** (6), 435-444.

# Title: Socio-Economic Planning Sciences

Full Journal Title: [Socio-Economic Planning Sciences](http://www.sciencedirect.com/science/journal/00380121)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Avkiran, N.K. and Parker, B.R. (2010), Pushing the DEA research envelope. *Socio-Economic Planning Sciences*, **44** (1), 1-7.

Full Text: [2010\Soc-Eco Pla Sci44, 1.pdf](2010/Soc-Eco%20Pla%20Sci44,%201.pdf)

Abstract: This brief article first investigates key dimensions underlying the progress realized by data envelopment analysis (DEA) methodologies. The resulting perspective is then used to encourage reflection on future paths for the field. Borrowing from the social sciences literature, we distinguish between problematization and gap identification in suggesting strategies to push the DEA research envelope. Emerging evidence of a declining number of influential methodological (theory)-based publications, and a flattening diffusion of applications imply an unfolding maturity of the field. Such findings suggest that focusing on known limitations of DEA, and/or of its applications, while searching for synergistic partnerships with other methodologies, can create new and fertile grounds for research. Possible future directions might thus include ‘DEA in practice’, ‘opening the black-box of production,’ ‘rationalizing inefficiency,’ and ‘the productivity dilemma.’ What we are therefore proposing is a strengthening of the methodology’s contribution to fields of endeavor both including, and beyond, those considered in the past.

Keywords: Advancing Research, Data Envelopment Analysis, Gap Identification, Problematization

# Title: Sociologia

Full Journal Title: Sociologia

ISO Abbreviated Title: Sociologia

JCR Abbreviated Title: Sociologia

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Mistrikova, L. (1996), Social context of health and illness: Starting points and facilities of investigation. *Sociologia*, **28** (4), 317-324.

Full Text: Sociologia28, 317.pdf

Abstract: The aim of the paper is to revive scientific interest in sociology of medicine as theoretical and methodological starting point of investigation of present problems of health and illness. The paper presents thematic field of sociology of medicine, its historical development, the relevance of study of patient-doctor relationship, the findings of social aspects of therapeutic process and relationship between sociology and clinical pharmacology. The author argues that people’s attitude (approach) towards their health, doctor. and their behaviour in patient’s role is changing due factors such as continuous increase of information and democratisation of people’s access to it, demythologising of medicine and failures of huge centralised health service institutions and the competition of so called alternative medicine. In changing social climate patient is expected to take active role in therapeutic process-to be informed, responsible and co-operating. On the other hand, the use of sociological knowledge can help physicians to do more effective therapy and contribute to enhanced human life quality. The paper draws attention to works of several contemporary authors with various disciplinary backgrounds (medicine, clinical pharmacology, epidemiology, etc.) joined by common interest in use of sociological knowledge and by taking sociology as the partner in interdisciplinary approach to multidimensional problem of human health.

# Title: Sociologia Ruralis

Full Journal Title: Sociologia Ruralis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tanaka, K., Juska, A. and Busch, L. (1999), Globalization of agricultural production and research: The case of the rapeseed subsector. *Sociologia Ruralis*, **39** (1), 54-77.

Full Text: [1999\Soc Rur39, 54.pdf](1999/Soc%20Rur39,%2054.pdf)

Abstract: In the realms of business, policy and intellectual discussion, science and technology have been treated historically as enabling agents for the development of new products, technologies, knowledge, organizational and geographical arrangements of economic activities. However, relatively little attention has been paid to the analysis of how the globalization of production activities, which has been made possible in part by various scientific achievements, is changing technoscience itself. This paper examines the worldwide interaction between agricultural research and agricultural production by using the rapeseed subsector as an example. Bibliometric data on rapeseed, and economic statistics of production, import and export of rapeseed and its products between 1940 and 1996 are used simultaneously to examine the globalization of the rapeseed subsector and research activities in Canada, the US, Japan, China, India, the UK, France and Germany. A typology of production and research strategies that major rapeseed producing countries use to compete on the world oilseed market is developed.

Keywords: Analysis, Bibliometric, Canola, China, Countries, Development, France, Germany, Globalization, Interaction, Japan, Knowledge, Research, Science, Science and Technology, Statistics, Technologies, Technology, US

# Title: Sociological Research Online

Full Journal Title: Sociological Research Online

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1360-7804

Issues/Year:

Journal Country

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

? Boudourides, M. and Antypas, G. (2002), A simulation of the structure of the World-Wide Web. *Sociological Research Online*, **7** (1).

Abstract: In this paper we are presenting a simple simulation of the Internet World-Wide Web, where one observes the appearance of web pages belonging to different web sites, covering a number of different thematic topics and possessing links to other web pages. The goal of our simulation is to reproduce the form of the observed World-Wide Web and of its growth, using a small number of simple assumptions. In our simulation, existing web pages may generate new ones as follows: First, each web page is equipped with a topic concerning its contents. Second, links between web pages are established according to common topics. Next, new web pages may be randomly generated and subsequently they might be equipped with a topic and be assigned to web sites. By repeated iterations of these rules, our simulation appears to exhibit the observed structure of the World-Wide Web and, in particular, a power law type of growth. In order to visualise the network of web pages, we have followed N. Gilbert’s (1997) methodology of scientometric simulation, assuming that web pages can be represented by points in the plane. Furthermore, the simulated graph is found to possess the property of small worlds, as it is the case with a large number of other complex networks.

Keywords: Complex, Internet, Lotka’s And Power Laws, Networks, Small World Complex Networks, Social Simulation, Topic, Topics, Web Pages, Web Sites, World-Wide Web As A Graph

# Title: Sociological Theory and Methods

Full Journal Title: Sociological Theory and Methods

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0913-1442

Issues/Year:

Journal Country

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

? Tsuzuki, K. (2002), An attempt to construct a mathematical model of the growth of mathematical sociology in Japan. *Sociological Theory and Methods*, **17** (1), 71-87.

Abstract: Scientometrics studies had made clear that the growth of science indexed by the number of the scientists or the number of the scientific papers shows exponential or logistic curve. On the other hand, according I Kuhn, the history of science shows cyclical pattern: paradigm revolution --> ripen --> normal science --> appearance of anomaly --> crisis --> paradigm revolution. The purpose of this paper is to try to integrate these two views, by building the mathematical model of the growth of science.

We present a model in which ‘possibility’ and ‘aporia’ are interacting. As a result of interaction of these, pattern of the growth of science prescribed. The model is formulated by differential equations. The solutions to the equations correspond to two growth patterns previously described.

Keywords: Sociology of Science, Scientific Growth, Possibility, Aporia, Differential Equation

# Title: Sociologija I Prostor

Full Journal Title: [Sociologija I Prostor](http://hrcak.srce.hr/index.php?show=toc&id_broj=5390)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

? Mali, F. (2010), Policy issues of the international productivity and visibility of the social sciences in Central and Eastern European countries. *Sociologija I Prostor*, **48** (188), 415-435.

Full Text: [2010\Soc Pro48, 415.pdf](2010/Soc%20Pro48,%20415.pdf)

Abstract: The contribution deals with the issue of the international productivity and visibility of the social sciences in Central and Eastern European (CEE) countries. The reasons why the social sciences in CEE countries lag behind in being more internationalised stem not only from the past, but also the present. The intellectual potential of the social sciences is often neither fully acknowledged nor effectively used by different groups of social actors. There is also a lack of institutional support from R&D policy decision-makers to encourage social scientists to publish more abroad and to establish excellent networks beyond national borders. In the paper, the main focus is national R&D evaluation systems. R&D evaluation systems play a crucial role in the allocation of financial support to scientists, the promotion of individual scientific careers, ensuring disciplinary (or interdisciplinary) standards etc. Last but not least, it is impossible to fully understand the state-of-the-art in the social sciences’ international productivity and visibility in CEE countries without explaining the context of how these national R&D evaluation systems function. Some analytical data are used to illustrate the international orientation of social scientists. These data warn that the great expectations that social scientists from this part of Europe would easily “break through” into publication channels in the West and thereby have a big scientific impact have yet to be realised.

Keywords: Bibliometrics, Co-Authorship, Europe, International Productivity and Visibility, Knowledge, Patterns, Peer Review, Policy, Publication, Publications, R&D Evaluation System, Research Collaboration, Social Sciences, Standards, State of the Art, Visibility

? Prpić, K. and Petrović, N. (2010), Croatian social scientists’ productivity and a bibliometric study of sociologists’ output. *Sociologija I Prostor*, **48** (188), 437-459.

Full Text: [2010\Soc Pro48, 437.pdf](2010/Soc%20Pro48,%20437.pdf)

Abstract: According to (pseudo)longitudinal empirical studies, the publication productivity of Croatian social scientists has been following the main global trends, especially the increase in co-authored and international/foreign publications. However, it shows more similarities to the social science output of other post-socialist countries than to the techno-scientifically developed European regions. The most recent bibliometric study of sociologists’ publication productivity offers a more detailed picture of social science publication practices, as well as a specific disciplinary culture. Books form an essential part of sociological and SS&H output and thus they should also be included in any system of research productivity monitoring and evaluation. Web of Science (WoS) and Google Scholar (GS) bibliographical and citation data bases differ in covering sociological publications (especially books), which results in considerably different indicators of the quantity and visibility of published output. Empirical typology of visibility of sociologists’ publications detects the difference between article and book visibility, as well as local and international visibility combined with WoS and GS coverage. The predictors of visibility types suggest that increasing the impact of Croatian sociological research should be based on stimulating publication by sociologists in both international books and journals.

Keywords: Australian Sociology, Bibliometric, Bibliometric Studies, Citation, Citation Patterns, Collaboration, Departments, Determinants, Disciplines, Humanities, Influential Books, Journals, Productivity, Productivity Patterns, Productivity Predictors, Publication, Publication Practices, Publication Productivity, Publications, Questionnaire Studies, Research, Sciences, Social Scientists, Sociologists, Visibility, Web of Science

# Title: Sociologisk Forskning

Full Journal Title: Sociologisk Forskning

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0038-0342

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Sage Publications Ltd, London

Publisher Address:

Subject Categories:

: Impact Factor

? Broady, D. and Persson, O. (1989), Bourdieu in the USA - Bibliometric notes. *Sociologisk Forskning*, **26** (4), 54-73.

Keywords: Bibliometric

? Melin, G. (1999), Globalization or internationalization in the sciences. *Sociologisk Forskning*, **36** (3), 22-36.

Abstract: The main question in this study is whether we can find empirical evidence of globalization in science or not. Usually the increasing number of co-authorships in the sciences is seen as an indicator of increasing research collaboration, which in turn is seen as part of the globalization-trend. Here, this chain is questioned and the relation and the difference between globalization and internationalization in science is investigated and discussed. A number of studies have shown how the amount of research collaboration is increasing but it is not clear that this is actually leading to globalization in science rather than internationalization. Through a number of empirical results the structure of international research collaboration is described. It is concluded that there may very well be an ongoing globalization-trend but this is hardly evident in empirical studies of research collaboration. What can be seen though is a strengthened internationalization-trend. Globalization seems to be a phenomenon that ought to be used more carefully and studied through both bibliometric and other methods.

Keywords: Bibliometric, Collaboration, Empirical Studies, Evidence, Globalization, Indicator, International, Internationalization, Methods, Research, Research Collaboration, Science, Sciences, Structure

? Ingwersen, P. (2003), Internationalization and homogenization: A bibliometric study of international management research. by Danell R. *Sociologisk Forskning*, **40** (1), 115-117.

? Ekerwald, H. (2009), Sociologisk Forskning, Web of Science Och Sociological Abstracts. *Sociologisk Forskning*, (3), 3-4

# Title: Sociology of Education

Full Journal Title: [Sociology of Education](http://www.jstor.org/journals/00380407.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0038-0407

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Bayer, A.E. and Folger, J. (1966), Some correlates of a citation measure of productivity in science. *Sociology of Education*, **39** (4), 381-390.

Full Text: [1960-80\Soc Edu39, 381.pdf](1960-80/Soc%20Edu39,%20381.pdf)

Fox, M.F. (1992), Research, teaching, and publication productivity: Mutuality versus competition in academia. *Sociology of Education*, **65** (4), 293-305.

Full Text: [1992\Soc Edu65, 293.pdf](1992/Soc%20Edu65,%20293.pdf)

Abstract: This article assesses two theoretical views about which there has been considerable, unresolved speculation: the mutuality versus the competition of research and teaching in academia. Going beyond previous restrictions in aims and methods of analysis, it analyzes the influence of research and teaching interests, time commitments, and orientations of faculty and their perceived environments on the publication productivity of social scientists in BA-, MA-, and Ph.D.-degree granting departments in four fields. Contrary to the mutuality perspective, the findings point to a strain between research and teaching: Those whose publication productivity is high have strong investments in research, but not in teaching. These findings suggest that research and teaching do not represent aspects of a single dimension of academic investments, but are different, conflicting dimensions. The relationships are stronger for faculty in BA-than in Ph.D.-granting departments.

Keywords: Scientists, Profession, Career

Rau, W. and Durand, A. (2000), The academic ethic and college grades: Does hard work help students to “make the grade”? *Sociology of Education*, **73** (1), 19-38.

Full Text: [2000\Soc Edu73, 19.pdf](2000/Soc%20Edu73,%2019.pdf)

Abstract: Most scholars and teachers accept, as part of the natural order of the universe, a strong relationship between study efforts and students’ academic performance. Yet, the only systematic investigation of this relationship a 12-year project at the University of Michigan, repeatedly found little to no correlation between hours studied and grades. The study presented here replicated parts of this project but did so with a different conceptualization of effort. This new perspective views effort as the outcome of an ‘academic ethic,’ a student worldview that emphasizes diligent, daily, and sober study. This article shows how this concept can be operationalized and measured and provides evidence for its existence among some students at Illinois State University. It then shows a significant and meaningful relationship between methodical, disciplined study and academic performance. It closes by considering how the selectivity of colleges and universities would affect the findings and suggests some new directions for research.

Keywords: Control Scale, Locus

# Title: Sociology of Health & Illness

Full Journal Title: [Sociology of Health & Illness](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=shil)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Armstrong, D. (2003), The impact of papers in Sociology of Health and Illness: A bibliographic study. *Sociology of Health & Illness*, **25**, 58-74.

Full Text: [S\Soc Hea Ill25, 58.pdf](S/Soc%20Hea%20Ill25,%2058.pdf)

Abstract: This paper examines the citation counts of papers published in the first 25 years of the Sociology of Health and Illness. According to this measure only a small number of papers have made a major impact on the discipline of sociology of health and illness and an analysis of these select papers identifies some common themes. In particular, ‘successful’ papers have provided important theoretical constructs for the field while exploration of aspects of identity has been a recurrent focus.

Keywords: Authorship, Citation Impact, Identity, Methods, Lay Constructions, Mortality, Inequalities, Knowledge, Gender, Place, Care

? Muntaner, C., Borrell, C., Ng, E., Chung, H., Espelt, A., Rodriguez-Sanz, M., Benach, J. and O’Campo, P. (2011), Review article: Politics, welfare regimes, and population health: Controversies and evidence. *Sociology of Health & Illness*, **33** (6), 946-964.

Full Text: [2011\Soc Hea Ill33, 946.pdf](2011/Soc%20Hea%20Ill33,%20946.pdf)

Abstract: In recent years, a research area has emerged within social determinants of health that examines the role of politics, expressed as political traditions/parties and welfare state characteristics, on population health. To better understand and synthesise this growing body of evidence, the present literature review, informed by a political economy of health and welfare regimes framework, located 73 empirical and comparative studies on politics and health, meeting our inclusion criteria in three databases: PubMed (1948-), Sociological Abstracts (1953-), and ISI Web of Science (1900-). We identified two major research programmes, welfare regimes and democracy, and two emerging programmes, political tradition and globalisation. Primary findings include: (1) left and egalitarian political traditions on population health are the most salutary, consistent, and substantial; (2) the health impacts of advanced and liberal democracies are also positive and large; (3) welfare regime studies, primarily conducted among wealthy countries, find that social democratic regimes tend to fare best with absolute health outcomes yet consistently in terms of relative health inequalities; and (4) globalisation defined as dependency indicators such as trade, foreign investment, and national debt is negatively associated with population health. We end by discussing epistemological, theoretical, and methodological issues for consideration for future research.

Keywords: Conceptual Considerations, Databases, Democracy, Determinants, Economic-Performance, European Countries, Globalisation, Government Partisanship, Health Outcomes, Income Inequality, ISI, ISI Web of Science, Literature, Literature Review, Neo-Liberalism, Outcomes, Political Tradition, Politics, Population Health, Primary, Public-Health, Pubmed, Quality-of-Life, Research, Review, Science, Social, Social Cohesion, State Characteristics, Web of Science, Welfare State

# Title: Soft Matter

Full Journal Title: Soft Matter

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Nieto, M., Nardecchia, S., Peinado, C., Catalina, F., Abrusci, C., Gutiérrez, M.C., Ferrer, M.L. and del Monte, F. (2010), Enzyme-induced graft polymerization for preparation of hydrogels: Synergetic effect of laccase-immobilized-cryogels for pollutants adsorption. *Soft Matter*, **6** (15), 3533-3540.

Full Text: [2010\Sof Mat6, 3533.pdf](2010/Sof%20Mat6,%203533.pdf)

Abstract: The use of polyethylene oxide-polypropylene oxide-polyethylene oxide block-copolymers as a mediator in the laccase-induced graft polymerization of diacrylic derivate of polyethylene glycols resulted in the formation of PEG-g-F68 hydrogels. The proper oxygen content in the reaction medium to obtain reasonable polymerization conversions (i.e., on one hand, laccase needs oxygen as substrate whereas, on the other, oxygen is a strong inhibitor of radical polymerizations) was achieved by the use of an enzymatic scavenging system consisting of glucose oxidase and glucose. Eventually, laccase was immobilized within the resulting PEG-g-F68 hydrogel with full preservation of enzyme activity. Laccases have been used for bioremediation purposes because of their ability to degrade phenolic compounds. Thus, laccase-immobilized PEG-g-F68 hydrogels were submitted to the ISISA (ice segregation induced self-assembly) process for preparation of laccase-immobilized PEG-g-F68 cryogels which exhibited a macroporous structure where immobilized laccase preserved almost total activity (ca. 90%) for a period exceeding three months after preparation. Synergy between macroporous structure (deriving from the ISISA process), amphiphilic domains (deriving from graft copolymer) and activity of the immobilized enzyme provided outstanding adsorption capabilities to the cryogels (up to 235 mg g-1).

Keywords: Adsorption, Aqueous-Solutions, Bioremediation, Block Copolymers, Blue-R Decolorization, Carbon, Chemical Cross-Linking, Copolymer, Glucose, Graft, Graft Polymerization, Hydrogel, Hydrogels, Ice, Immobilized, Induced, Inhibitor, Macroporous, Microhoneycombs, Nanoparticles, Needs, Oxide, Oxygen, Pollutants, Poly(Acrylic Acid), Polyethylene, Polymerization, Preparation, Preservation, Radical Polymerization, Scaffolds, Self-Assembly, Structure, Systems

? Reynaud, F., Tsapis, N., Deyme, M., Vasconcelos, T.G., Gueutin, C., Guterres, S.S., Pohlmann, A.R. and Fattal, E. (2011), Spray-dried chitosan-metal microparticles for ciprofloxacin adsorption: Kinetic and equilibrium studies. *Soft Matter*, **7** (16), 7304-7312.

Full Text: [2011\Sof Mat7, 7304.pdf](2011/Sof%20Mat7,%207304.pdf)

Abstract: Chitosan, a natural polysaccharide obtained from chitin deacetylation, complexes with metal ions by coordination with the free electron pairs of amine groups. Based on this complexation mechanism, cross-linked chitosan-metal microparticles were prepared by spray drying using iron (II or III) or zinc ions and characterized in terms of size distribution and capacity to specifically adsorb ciprofloxacin. Chitosan-Zn(II) and chitosan-Fe(III) microparticles appear to adsorb more ciprofloxacin than plain chitosan or chitosan-Fe(II) microparticles. Adsorption isotherms for CH and CH-Fe(II) microparticles can be fitted by a single logarithm model (slope 1) with one ciprofloxacin per adsorption site, whereas for CH-Fe(II) and CH-Zn(II) microparticles, isotherms are bilogarithmic with an initial slope of 2, suggesting that a single adsorption site can bind two molecules of ciprofloxacin. In addition, the pseudo second order kinetic model fits well experimental data, proving that adsorption is mediated by a chemical reaction. CH-Fe(II) and CH-Zn(II) appear very promising for drug elimination, either from hospital waste water or from the gastrointestinal tract to prevent the emergence of antibiotic resistance.

Keywords: Adsorption, Adsorption Isotherms, Antibiotics, Aquatic Environment, Chitosan, Complexation, Complexes, Cross-Linking, Environmental Risk-Assessment, Equilibrium, Hospital Effluent, Isotherms, Kinetic, Kinetic Model, Mechanism, Microspheres, Pharmaceuticals, Removal, Waste, Waste-Water, Waste-Water Bacteria, Water, Zinc

# Title: Software Testing Verification & Reliability

Full Journal Title: Software Testing Verification & Reliability

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hayes, J.H. and Offutt, J. (2010), Recognizing authors: An examination of the consistent programmer hypothesis. *Software Testing Verification & Reliability*, **20** (4), 329-356.

Abstract: Software developers have individual styles of programming. This paper empirically examines the validity of the consistent programmer hypothesis: that a facet or set of facets exist that can be used to recognize the author of a given program based on programming style. The paper further postulates that the programming style means that different test strategies work better for some programmers (or programming styles) than for others. For example, all-edges adequate tests may detect faults for programs written by Programmer A better than for those written by Programmer B. This has several useful applications: to help detect plagiarism/copyright violation of source code, to help improve the practical application of software testing, and to help pursue specific rogue programmers of malicious code and source code viruses. This paper investigates this concept by experimentally examining whether particular facets of the program can be used to identify programmers and whether testing strategies can be reasonably associated with specific programmers. Copyright (c) 2009 John Wiley & Sons, Ltd.

Keywords: Author Identification, Authors, Metrics, Plagiarism Detection, Software Testing, Source Code, Source Code Metrics, Static Analysis, Testability

# Title: Soil Biology & Biochemistry

Full Journal Title: [Soil Biology & Biochemistry](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5163&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=59c547cb1dc8472cd8d41994cf74e594)

ISO Abbreviated Title: Soil Biol. Biochem.

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Journal Country England

Language: Multi-Language

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Agriculture, Soil Science: Impact Factor 1.747, 1/29 (2000)

Mullen, M.D., Wolf, D.C., Beveridge, T.J. and Bailey, G.W. (1992), Sorption of heavy-metals by the soil fungi *Aspergillus-Niger* and *Mucor-rouxii*. *Soil Biology & Biochemistry*, **24** (2), 129-135.

Full Text: [S\Soi Bio Bio24, 129.pdf](S/Soi%20Bio%20Bio24,%20129.pdf)

Abstract: Sorption of the nitrate salts of cadmium(II), copper(II), lanthanum(III) and silver(I) by two fungi, *Aspergillus niger* and *Mucor rouxii*, was evaluated using Freundlich adsorption isotherms and energy dispersive X-ray electron microscopy. The linearized Freundlich isotherm described the metal sorption data well for metal concentrations of 5 µm-1 mm metal. Differences in metal binding were observed among metals, as well as between fungal species- Calculated Freundlich K values indicated that metal binding decreased in the order La3+ greater-than-or-equal-to Ag+ > Cu2+ > Cd2+. However, sorption of Ag+ was greater than that of La3+ from solutions of 0.1 and 1 mm metal and likely due to precipitation at the cell wall surface. At the 1 mm initial concentration, there were no significant differences between the two fungi in metal sorption, except for Ag+ binding. At the 5 µm concentration, there was no difference between the fungi in their sorption capacities for the four metals. Electron microscopy-energy dispersive X-ray analysis indicated that silver precipitated onto cells as colloidal silver. The results indicate that Freundlich isotherms may be useful for describing short-term metal sorption by fungal biomass and for comparison with other soil constituents in standardized systems.

Keywords: Bacillus-Subtilis, Stability-Constants, Cell-Walls, Biomass, Removal, Cadmium, Adsorption, Retention, Polymers, Binding

Ledin, M., Krantzrulcker, C. and Allard, B. (1996), Zn, Cd and Hg accumulation by microorganisms, organic and inorganic soil components in multicompartment systems. *Soil Biology & Biochemistry*, **28** (6), 791-799.

Full Text: [S\Soi Bio Bio28, 791.pdf](S/Soi%20Bio%20Bio28,%20791.pdf)

Abstract: A multi-compartment system, PIGS (Partitioning in Geobiochemical Systems), with five compartments was constructed to study metal distribution between soil constituents. Soil microorganisms (*Pseudomonas putida*, *Trichoderma harzianum*) were compared with common soil minerals (kaolin and aluminium oxide) and solid organic matter (peat) with respect to their ability to accumulate Zn, Cd and Hg. Experiments were conducted under conditions that are representative of natural soils concerning pH, metal concentration, ionic strength and microbial activity. Different relative amounts of the solid phases were used to approach natural conditions. Results from the PIGS indicated considerable differences in metal distribution between the various solids and also indicated that for the different solid phases metal distribution was related to variations in pH and ionic strength of the solutions in different ways. The presence of fulvic acid generally decreased metal accumulation by peat and microorganisms around neutral pH. Accumulation by organic compounds (peat), as well as by microorganisms, was substantial under experimental conditions used, i.e. up to more than 40 and 20% of the added metals was accumulated by these components, respectively. In some cases the considerable accumulation of trace metals by the fungus and the bacterium under acidic conditions is of particular interest, since this process may counteract the metal-mobilizing effects of soil acidification. It is evident from our study that microorganisms should not be overlooked when studying metal interactions with soil constituents.

Krantz-Rülcker, C., Allard, B. and Schnürer, J. (1996), Adsorption of IIB-metals by three common soil fungi: Comparison and assessment of importance for metal distribution in natural soil systems. *Soil Biology & Biochemistry*, **28** (7), 967-975.

Full Text: [S\Soi Bio Bio28, 967.pdf](S/Soi%20Bio%20Bio28,%20967.pdf)

Abstract: Interactions of IIb-elements, Zn, Cd and Hg, with three common soil fungi, *Trichoderma harzianum*, *Penicillium* *spinulosum* and *Mortierella isabellina*, have been studied. The accumulation of the metals by the fungi was studied as a function of pH at constant ionic strength and at concentration levels of the metals representative of natural systems. Two stages of fungal activity were considered in the experiments. The fungi generally exhibited high affinity for metal ions indicated by distribution coefficients (log Kd, in 1 kg-1) of about 3.5±1, 2.5±1 and 4±1 for Zn, Cd and Hg, respectively. The pH-dependence of the accumulation as well as the isotherms at constant pH were similar between the fungi, and the maximum capacities were at least 50 mmoles kg-1 mycelium (dw). Metal accumulation by starved mycelia was almost independent of pH, while non-starved mycelia in two cases accumulated more metals at low pH. Calculations of the distribution of metals in a model soil system of inorganic and organic constituents as well as fungal biomass indicated that the amounts of metal associated to the fungi are negligible at neutral pH. However, due to the ability of these fungi to accumulate metals independently of pH, the fraction of metals associated to fungal biomass at low pH may be significant, and, in some cases, predominant. This illustrates that the effects of fungi on metal distribution in soil should not be neglected, e.g. during a progressing acidification.

Speir, T.W., Kettles, H.A., Parshotam, A., Searle, P.L. and Vlaar, L.N.C. (1999), Simple kinetic approach to determine the toxicity of As(V) to soil biological properties. *Soil Biology & Biochemistry*, **31** (5), 705-713.

Full Text: [S\Soi Bio Bio31, 705.pdf](S/Soi%20Bio%20Bio31,%20705.pdf)

Full Text: Three New Zealand soils of contrasting texture, organic matter content and CEC were amended with Na2HAsO4.7H2O solutions, spanning the concentration range, 0–50 μmol As[V] g-1 soil. Samples were assayed for phosphatase, sulphatase and urease enzyme activities and for basal respiration, microbial biomass C (by substrate-induced respiration, SIR), dimethyl sulphoxide (DMSO)-reducing activity and denitrification, 3 and 60 d after amendment. Only phosphatase, sulphatase and DMSO-reducing activities were consistently inhibited by As[V], the remaining properties were generally unaffected or were stimulated. When inhibition occurred, it could in most instances be explained by one or both of two simple Michaelis Menten kinetic models. The first of these (model 1) described fully competitive kinetics and the second (model 2) described partially competitive kinetics. A single inhibition constant, similar to ED50 (ecological dose) as conceptualised in previous studies, could be calculated. In comparison with heavy metals, As[V] was not a potent inhibitor of soil biochemical properties, with ED50 values ranging from 2.18–556 μmol As g-1 soil (0.163–41.7 g kg-1). Generally, phosphatase was the most sensitive property, probably due to the structural similarity of phosphate and arsenate. Basal respiration and denitrification were the most activated properties, the former increasing linearly with increasing As[V] concentration. Soil textural characteristics influenced the sensitivity of properties between the different soils, the coarsely textured sandy soil was both the most biochemically sensitive to and the least sorptive of As[V]. For one soil only there was a consistent effect of time since amendment, with diminished inhibition or enhanced activation at 60 d compared with 3 d.

Kampichler, C., Bruckner, A. and Kandeler, E. (2001), Use of enclosed model ecosystems in soil ecology: A bias towards laboratory research. *Soil Biology & Biochemistry*, **33** (3), 269-275.

Full Text: [S\Soi Bio Bio33, 269.pdf](S/Soi%20Bio%20Bio33,%20269.pdf)

Enclosed model ecosystems, or *microcosms*, have become a major research tool in soil ecology. Due to the speed, statistical power and mechanistic insights attainable with laboratory-based microcosm experiments, these have added considerably to our ecological knowledge. However, soil ecologists agree that, due to problems of scale and artificiality, microcosm research should be carried out in the context of appropriately scaled field model ecosystems (e.g. mesocosms). This paper aims at clarifying the terminology of enclosed model ecosystems as well as determining and discussing the frequency with which laboratory and field model ecosystems are used in current soil-ecological research. Among 92 model ecosystem studies published from 1993 to 1998 in soil biological journals, only 19 were performed in the field. Laboratory microcosms are, on average, significantly smaller and experiment duration is significantly shorter than in field model ecosystem studies. They are easier to maintain and allow for a larger number of experiments in a unit of time. We argue that the bias towards laboratory research is mainly caused by the growing demand for publications with high-impact ratings in an increasingly competitive scientific world and by the fact that an increasing emphasis is being placed on subjects where research can be carried out very quickly.

Keywords: Microcosm, Mesocosm, Enclosure, Scale, Reality, Publication Impact Factors

# Title: Soil Dynamics and Earthquake Engineering

Full Journal Title: [Soil Dynamics and Earthquake Engineering](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5771&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=8ff39dab1eeb7b715a68080f5a4e1daf)

ISO Abbreviated Title: Soil Dyn. Earthq. Eng.

JCR Abbreviated Title: Soil Dyn Earthq Eng

ISSN: 0267-7261

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Journal Country England

Language: English

Publisher: Elsevier Sci Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, Oxon, England

Subject Categories:

Engineering, Geological Geosciences, Interdisciplinary: Impact Factor

Durukal, E., Erdik, M., Avci, J., Yüzügüllü, Ö., Alpay, Y., Avar, B., Zülfikar, C., Biro, T. and Mert, A. (1998), Analysis of the strong motion data of the 1995 Dinar, Turkey earthquake. *Soil Dynamics and Earthquake Engineering*, **17** (7-8), 557-578.

Full Text: [S\Soi Dyn Ear Eng17, 557.pdf](S/Soi%20Dyn%20Ear%20Eng17,%20557.pdf)

Abstract: Dinar earthquake (Mw = 6.0, USGS) occurred on October 1, 1995 causing casualties and physical damage (Io = VII-VIII MSK). The earthquake was associated with predominantly normal faulting. The PGA in Dinar was 0.33 g. Strong motion data associated with the mainshock and aftershocks of the 1995 Dinar, Turkey earthquake have been analyzed to investigate the source, attenuation and site response parameters. Strong motion data were baseline corrected, local magnitudes were computed and inelastic attenuation parameters, seismic moments and corner frequencies were assessed. A parametric analysis is attempted to understand the correlation of damage distribution with the fault parameters. It is believed that the obtained data will complement the relatively scarce earthquake data associated with extensional regimes.

Athanasopoulos, G.A., Pelekis, P.C. and Leonidou, E.A. (1999), Effects of surface topography on seismic ground response in the Egion (Greece) 15 June 1995 earthquake. *Soil Dynamics and Earthquake Engineering*, **18** (2), 135-149.

Full Text: [S\Soi Dyn Ear Eng18, 135.pdf](S/Soi%20Dyn%20Ear%20Eng18,%20135.pdf)

Abstract: The Greek coastal town of Egion on 15 June 1995 was shaken by a strong, small epicentral distance, earthquake that caused heavy damages to buildings and loss of life. The damages were concentrated in the central elevated part of the town whereas the flat coastal region remained almost intact. This non-uniform distribution of damage is studied in this article in terms of surface topography effects by conducting seismic response analyses of a simplified 2-D profile of the town. A dynamic finite element code implementing the equivalent-linear soil behavior (FLUSHPLUS) was used for the analyses and it was found that the step-like topography amplified greatly the intensity of motion without affecting its frequency content. The analyses showed that the motion recorded by an accelerograph installed at the center of the town is in agreement with the computed values, they also indicated a particularly intense amplification close to the crest of the steep slope, where a multi-story RC residential building partially collapsed. In contrast, the level of motion was found to be low at the flat coastal zone of the town where the earthquake damages were insignificant. It is concluded that the characteristic surface topography of the town played an important role in modifying the intensity of base motion.

# Title: Soil Nitrogen

SSSA Sepc. Publ. 27. SSSA, Madison, WI

Broadbent, F.E. and Clark, F. (1965), Denitrification. in *Soil Nitrogen*, (Edited by Bartholomew, W.V. and Clark, F.E.), Agronomy No. 10, American Society of Agronomy, Madison, Wisconsin, 344-359.

# Title: Soil Organic Matter

Elsevier, New York

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# Title: Soil Phosphorus

Academic Press, New York

? Larson, S. (1967), *Soil Phosphorus*, Academic Press, New York.

# Title: Soil Physical Chemistry

CRC Press, Boca Raton, Florida

White, G.N. and Zelazny, L.W. (1986), Charge properties of soil colloids. in *Soil Physical Chemistry*, (Edited by Sparks, D.L.), CRC Press, Boca Raton, Florida, 39-81.

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# Title: Soil Science

Full Journal Title: [Soil Science](http://ovidsp.tx.ovid.com/sp-2.3.1b/ovidweb.cgi?QS2=434f4e1a73d37e8ce9039fe5cc4f834c8ab8fa6dc7c41b4ab2b18a37d3cc35324719fb081285188ba2828891557fc676f5f58a817508e2de36b55a6f3ea8567767fa0cd04813b9f6fd56a0b218ecea7e1191bd344cc17554fcd3159f44d1c32b8625e22866ff)

ISO Abbreviated Title: Soil Sci.

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ISSN: 0038-075X

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Language: English

Publisher: Lippincott Williams & Wilkins

Publisher Address: 530 Walnut St, Philadelphia, PA 19106-3621

Subject Categories:

Agriculture, Soil Science: Impact Factor 0.923, 13/29 (2000)

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Full Text: [-1959\Soi Sci5, 123.pdf](-1959/Soi%20Sci5,%20123.pdf)

Keywords: Growth, Sand, SCI, Soil, Solution, Sulfate, USA

Kerr, H.W. (1928), The identification and composition of the soil alumino-silicate active in base exchange and soil acidity. *Soil Science*, **26** (5), 385-398.

Full Text: [-1959\Soi Sci26, 385.pdf](-1959/Soi%20Sci26,%20385.pdf)

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Full Text: -1959\Soi Sci55, 1.pdf

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Fried, M., Hagen, C.E., Saiz Del Rio, J.F. and Leggett, J.E. (1957), Kinetics of phosphate uptake in the soil-plant system. *Soil Science*, **84** (6), 427-437.

Full Text: [-1959\Soi Sci84, 427.pdf](-1959/Soi%20Sci84,%20427.pdf)

Schnitzer, M. and Skinner, S.I.M. (1966), Organo-metallic interactions in soils: 5. Stability constants of Cu2+-, Fe2+- and Zn2+-fulvic acid complexes. *Soil Science*, **102** (6), 361-365.

Full Text: [1960-80\Soi Sci102, 361.pdf](1960-80/Soi%20Sci102,%20361.pdf)

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Full Text: [1960-80\Soi Sci116, 400.pdf](1960-80/Soi%20Sci116,%20400.pdf)

Abstract: The phosphate adsorption by hematite and gibbsite conformed to the Freundlich equation. The rate of phosphate adsorption was rapid initially and decreased with prolonged reaction time. A two-constant rate equation was developed which successfully described the rate of phosphate adsorption. The low activation energy of phosphate adsorption indicated that the adsorption was a diffusion controlled process. The highly complexing agent, EDTA=, was more effective than oxalate, hydroxyl, and fluoride anions in releasing adsorbed phosphate. The rate of phosphate release was similar to the rate of phosphate adsorption and could be described by the proposed two-constant rate equation. (C) Williams & Wilkins 1973. All Rights Reserved.

Evans, R.L. and Jurinak, J.J. (1976), Kinetics of phosphate release from a desert soil. *Soil Science*, **121** (4), 205-211.

Full Text: [1960-80\Soi Sci121, 205.pdf](1960-80/Soi%20Sci121,%20205.pdf)

Abstract: The kinetics of indigenous phosphorus release from the surface and subsoil of Thiokol silt loam, a typic calciorthid, was studied at 11°, 25°, and 40°C. The anion-resin technique was used to obtain the P-release data. The P-release data from the two samples over a period of 5 days could be described by three simultaneous first-order-rate expressions. Three reactions are proposed which could account for the kinetic data. The calculated specific rate constants for any given reaction were similar in both the surface and subsurface soil, suggesting the same reactions were occurring. However, there was a marked difference noted in the total amount of phosphorus released by the soil from the two depths. The effect of temperature on the phosphorus release kinetics was small resulting in activation energies with values between 2 and 3 kcal/m. Thus, the release of phosphorus from this desert soil is not a major energy-consuming process. The parabolic diffusion expression defined P release from the surface and subsoil for only the initial 16 min of reaction. (C) Williams & Wilkins 1976. All Rights Reserved.

Moreale, A. and van Bladel, R. (1979), Soil interactions of herbicide-derivated aniline residue: A thermodynamic approach. *Soil Science*, **127** (1), 1-9.

Full Text: [1960-80\Soi Sci127, 1.pdf](1960-80/Soi%20Sci127,%201.pdf)

Abstract: Interactions between soil and aniline residues increase with temperature. Exothermic values of free energy change point out the higher affinity of the Soignies soil colloids for p-chloroaniline, in comparison to aniline, with increasing temperature. The magnitude of adsorption of these aniline residues was inversely related to their water solubilities. The temperature coefficient of the thermodynamic equilibrium constant, expressed per unit of organic matter, emphasizes the greater reactivity of Soignies soil organic matter. The net increase in entropy change, calculated for that substrate, indicates higher stability of these amine-soil colloids complexes. Results of the thermodynamic study suggest that diffusion processes of p-chloroaniline within a porous adsorbent, like Soignies soil organic matter, must play a leading part in the overall energetic process of the adsorption reaction. This view is further supported by values of adsorption rate constant derived from the rates of adsorption of p-chloroaniline by the two soil types. (C) Williams & Wilkins 1979. All Rights Reserved.

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Full Text: [1960-80\Soi Sci128, 65.pdf](1960-80/Soi%20Sci128,%2065.pdf)

Abstract: The Dubinin-Radushkevich (DR) adsorption isotherm, using Polanyi’s potential for sparingly soluble solutes, was applied to phosphorus sorption by 20 soils. The DR isotherm is where [epsilon], the Polanyi potential, is X is the amount of phosphorus adsorbed, Xm is the adsorption maximum, and C is the equilibrium phosphorus concentration. B is a constant and is related to the mean energy of adsorption, R is a gas constant, and T is absolute temperature. The DR isotherm was obeyed so long as phosphorus sorption occurred within the single phase of sparingly soluble phosphorus compounds. The adsorption maxima obtained by the DR isotherm and the Langmuir isotherm were essentially similar. The mean energy of adsorption indicated that diffusion (or anion exchange) controlled the process of phosphorus sorption by soils. (C) Williams & Wilkins 1979. All Rights Reserved.

Notes: highly cited

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Full Text: [1960-80\Soi Sci129, 266.pdf](1960-80/Soi%20Sci129,%20266.pdf)

Abstract: We investigated humic substances by surface pressure and viscosity measurements at different pHs and neutral salt concentrations to elucidate their macromolecular configurations. We observed that such configurations were not unique, they varied with the changes in the medium. The controlling parameters were sample concentration, pH of the system, and the ionic strength of the medium. Model macromolecular structures are proposed on the basis of our investigation and of data published in the literature. With the aid of these models, we were able to resolve the contradictions between the so-called rigid “spherocolloid” and flexible “linear molecule” concepts. Our work shows that humic and fulvic acids behave like rigid spherocolloids at high sample concentrations, low pH, or in the presence of sufficient amounts of neutral electrolytes, but they are flexible linear colloids at low sample concentrations, provided that the pH is not too low or that the ionic strength is relatively low, conditions that normally prevail in soils. (C) Williams & Wilkins 1980. All Rights Reserved.

Ou, L.T. (1984), 2,4-D degradation and 2,4-D degrading, microorganisms in soils. *Soil Science*, **137** (2), 100-107.

Full Text: [1984\Soi Sci137, 100.pdf](1984/Soi%20Sci137,%20100.pdf)

Abstract: In laboratory studies on Cecil loamy sand and Webster sandy clay loam, I examined the influence of soil-water tension and soil temperature on 14C-2,4-D degradation and the formation of nonextractable 14C-residues, and I correlated the degradation rate with the growth rate of 2,4-D degrading microorganisms. 14C-2,4-D rapidly mineralized in the two soils maintained at 0.1 and 0.33 bar of soil-water tension. Because the total amounts of metabolites in the solvent extracts never exceeded 5% of the total 14C activity, the disappearance rate of extractable 14C essentially represented the disappearance rate of extractable 14C-2,4-D. Extractable 14C in the 14C-2,4-D treated soils maintained at 1 bar and below disappeared rapidly, and at the same time nonextractable 14C rapidly formed, whereas extractable 14C in soils maintained at 15 bars disappeared at much slower rates, and the formation of nonextractable 14C was also slower. After 14 d of slow disappearance, however, extractable 14C in the Cecil soil held at 15 bars started disappearing at a constant rate of 3.6% of applied 14C per day. The disappearance rates in soils incubated at 35°C were generally smaller than those incubated at 25°C. Even though the initial most probable number (MPN) of 2,4-D degrading microorganisms in the Cecil soil was one fourth of that in the Webster soil, the organisms propagated more rapidly in the moist Cecil soil (0.33 bar) than in the moist Webster soil in response to the application of 10 μg 2,4-D/g of soil. As a result, 2,4-D in the Cecil soil degraded at a faster rate. The growth rates of 2,4-D degrading organisms in dry soils (15 bars) were small, in spite of the rapid degradation occurring in the Cecil soil after 14 d of incubation. In addition to forming nonextractable 14C residues in humus components, as much as 4.2% of applied 14C could be associated with microbial mass. (C) Williams & Wilkins 1984. All Rights Reserved.

Body, S.A. and King, R. (1984), Adsorption of labile organic compounds by soil. *Soil Science*, **137** (2), 115-119.

Full Text: [1984\Soi Sci137, 115.pdf](1984/Soi%20Sci137,%20115.pdf)

Abstract: Rapid degradation of p-cresol in aerobic soil prohibited measurement of adsorption by the batch technique. Degradation of p-cresol was not observed under anaerobic conditions over a period of 96 h. Adsorption of p-cresol measured using the batch technique and soil incubated anaerobically demonstrated that adsorption equilibrium was attained within 24 h and that the Freundlich K values (K = 1.1) remained essentially constant for 96 h. Adsorption of 2,3-dichlorophenol and 2,4-dichlorophenol by aerobic, anaerobic, and autoclaved soil was compared. Freundlich K values describing adsorption of 2,3-dichlorophenol and 2-4 dichlorophenol by aerobic and anaerobic soil were similar. Freundlich K values obtained using autoclaved soil were significantly higher. These results indicated that an accurate measurement of adsorption of labile organic compounds can be achieved by using anerobic conditions to prohibit degradative losses. (C) Williams & Wilkins 1984. All Rights Reserved.

Sparks, D.L. and Jardine, P.M. (1984), Comparison of kinetic equations to describe potassium-calcium exchange in pure and in mixed systems. *Soil Science*, **138** (2), 115-122.

Full Text: [1984\Soi Sci138, 115.pdf](1984/Soi%20Sci138,%20115.pdf)

Abstract: We used first-order, Elovich, parabolic diffusion, and zero-order equations to describe the kinetics of K-Ca exchange in kaolinite, montmorillonite, vermiculite and soils of the Atlantic Coastal Plain Region. The first-order equation was the best of the various kinetic equations studied to describe the reaction rate of K adsorption in the clay minerals and soils, as evidenced by the highest simple correlation coefficients (r) and the lowest values of the standard error of the estimate (SE). The parabolic diffusion law described K adsorption best on vermiculite and soils dominated by vermiculitic clay minerals. The parabolic diffusion law did not describe K adsorption well on kaolinite and soils high in kaolinite. These differences were related to the kinds of binding sites present in the pure and mixed systems. The Elovich and zero-order equations did not satisfactorily describe K adsorption in the soils and clays. Apparent potassium adsorption rate coefficients (ka/) were 0.23, 0.58, and 2.65 h-1 for vermiculite, montmorillonite, and kaolinite, respectively. The ka/ values for the soils ranged from 0.84 to 1.86 h-1, and their magnitude was related to the type and quantity of clay minerals present. (C) Williams & Wilkins 1984. All Rights Reserved.

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Full Text: [1985\Soi Sci140, 406.pdf](1985/Soi%20Sci140,%20406.pdf)

Abstract: Zinc solubility at pH higher than 7.9 was controlled by precipitation of Zn as Zn(OH)2 or ZnCO3 in sodic soils. In the pH range of 6.0 to 7.9, Zn solubility was highly pH dependent, and the chemisorption reactions controlled the Zn concentration of the equilibrium solution. At low pH, 4.2 to 6.0, a reduction in the adsorption of Zn may be attributed to an increase in concentration of competing cations, such as Al, Mn, Fe, and Ca, and to the partial dissolution of soil mineral carbonates. -from Authors [Journal, In English]

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Full Text: [1989\Soi Sci148, 370.pdf](1989/Soi%20Sci148,%20370.pdf)

Abstract: We studied the retention of 15 elements by 11 soils from 10 soil orders to determine the effects of element and soil properties on the magnitude of the Freundlich parameters Kd and n. The magnitude of Kd and n was related to both soil and element properties. Strongly retained elements, such as Cu, Hg, Pb, V, and P had the highest Kd values. The transition metal cations Co and Ni had similar Kd and n values, as did the group IIB elements Zn and Cd. Oxyanion species tended to have lower n values than did cation species. Soil pH and CEC were significantly correlated with log Kd values for cation species. High pH and high CEC soils retained greater quantities of the cation species than did low pH and low CEC soils. A significant negative correlation between soil pH and the Freundlich parameter n was observed for cation species, whereas a significant positive correlation between soil pH and n for Cr(VI) was found. Greater quantities of anion species were retained by soils with high amounts of amorphous iron oxides, aluminum oxides, and amorphous material than were retained by soils with low amounts of these minerals. Several anion species were not retained by high pH soils. Despite the facts that element retention by soils is the result of many interacting processes and that many factors influence retention, significant relationships among retention parameters and soil and element properties exist even among soils with greatly different characteristics. (C) Williams & Wilkins 1989. All Rights Reserved.

Cancela, G.D., Taboada, E.R. and Sanchezrasero, F. (1990), Adsorption of cyanazine on peat and montmorillonite clay surfaces. *Soil Science*, **150** (6), 836-843.

Full Text: [1990\Soi Sci150, 836.pdf](1990/Soi%20Sci150,%20836.pdf)

Abstract: The adsorption of cyanazine by peat and montmorillonite is studied as a function of the crystal chemical characteristics of exchangeable cations and temperature. The adsorption kinetics of cyanazine on peat shows that the adsorption equilibrium is reached within 1 h. The values of the rate constants of the reaction seem to indicate that the adsorption rate of cyanazine by peat is mainly controlled by the diffusion process. The order of adsorption of cyanazine by peat is as follows: H+-peat > Cu2+-peat > Ca2+-peat > Co2+-peat > Mg2+-peat > K+-peat. The thermodynamic parameters seem to point to an adsorption mechanism by hydrogen bonds, although in the acidic and Cu2+ samples a protonation process and adsorption of the protonated species is also likely. The values of the adsorption rate constant of cyanazine by montmorillonite is ten times higher than that for peat. The adsorption of cyanazine by montmorillonite follows this order: Cu2+-mont > Co2+-mont > H+-mont, the adsorption on Cu2+-mont is five times greater than on the other samples. For the Cu2+ samples, the thermodynamic parameters seem to point to a mechanism of direct coordination cyanazine-Cu2+. The most probable mechanism for the adsorption of cyanazine by the Co2+ sample is by physical bonding. For the H+ sample there is a physical adsorption and an ionic one according to the following reaction: H+-mont + cyanazine -> mont - H+-cyanazine. (C) Williams & Wilkins 1990. All Rights Reserved.

? Fu, G.M., Allen, H.E. and Cowan, C.E. (1991), Adsorption of cadmium and copper by manganese oxide. *Soil Science*, **152** (2), 72-81.

Full Text: [1991\Soi Sci152, 72.pdf](1991/Soi%20Sci152,%2072.pdf)

Abstract: Cadmium and copper adsorption by delta-MnO2 was investigated by potentiometric titration over a range of pH. Adsorption increased with increasing pH because of hydrolysis of metal cations and/or variable charge sites on delta-MnO2. The surface acidity constant for delta-MnO2 was determined using the Triple Layer Model to be pK(int, a2) = 5.34. The data from titrations with pH as master variable were analyzed to determine the Triple Layer Model intrinsic stability constants, p\*K(int, Cd2+) = 0.81, p\*K(int, CdOH)+ = 6.89, p\*K(int, Cu2+) = 1.66, and p\*K(int, CuOH+) = 3.79 for cadmium and copper adsorption onto delta-MnO2. Titrations with metal ion as the master variable were performed at constant pH to estimate the adsorption capacities. The data conformed to a Langmuir isotherm and could be modeled with the Triple Layer Model constants. For cadmium, at pH 5.5, 7.0, and 8.0, the adsorption capacity is 0.434, 1.08, and 1.92 mmol/g, respectively. The affinity of delta-MnO2 for Cu, 1.54 mmol/g at pH 5.5, is greater than that for cadmium. The results show delta-MnO2 has high adsorption capacities and high adsorption affinities for cadmium and copper even in acidic conditions.

Keywords: Interface, Ligands

? Aharoni, C., Pasricha, N.S. and Sparks, D.L. (1993), Adsorption and desorption-kinetics of cesium in an organic matter-rich soil saturated with different cations. *Soil Science*, **156** (4), 233-239.

Full Text: [1992\Soi Sci156, 233.pdf](1992/Soi%20Sci156,%20233.pdf)

Abstract: Samples of soils made homoionic with K, Na, or Ca were reacted with solutions containing Cs ions, and the quantities of Cs sorbed and the rates of exchange were measured. The samples were then reacted with solutions containing K, Na, or Ca, and the quantities of Cs desorbed and the rates of exchange were again measured. Samples made homoionic with Na had a greater ion exchange capacity than samples made homoionic with K, and, in both cases, the ion exchange capacity increased with the organic matter content of the soil. For samples pretreated with Ca, the ion exchange capacity is not related in a simple way to the organic matter content. The kinetics were assessed by plotting the rate of exchange vs. the time and vs. the quantity exchanged. A first-order equation was obeyed during most of the run in Cs desorption experiments and during a limited part of the run in Cs adsorption experiments. An increase in the rate of Cs exchange was observed at the beginning of the experiments especially for Cs adsorption. This increase is presumably due to an increase of the ionic strength of the liquid phase during the exchange process.

Keywords: Calcareous Soils, Diffusion, Equations, Exchange, Mathematical-Models, Miscible Displacement, Potassium Release Kinetics, Sorption, Systems

? Amalfitano, C., Quezada, R.A., Wilson, M.A. and Hanna, J.V. (1995), Chemical-composition of humic acids: A comparison with precursor light fraction litter from different vegetations using spectroscopic techniques. *Soil Science*, **159** (6), 391-401.

Full Text: [1995\Soi Sci159, 391.pdf](1995/Soi%20Sci159,%20391.pdf)

Abstract: Humic acids from a range of Italian soils and the residual suspended organic material (light fraction litter) associated with them have been studied by pyrolysis gas chromatography mass spectrometry, solid state nuclear magnetic resonance spectroscopy, and infra-red spectroscopy. Although the major vegetation types on the soils differ considerably, spectra of humic acids from soils with different major vegetation types were similar. Because no relationship between humic acid structure and major vegetation type was observed, gross assumptions about humic acid structure should not be drawn from a knowledge of macro-vegetation types on soils. Light fraction litter in the soils from minor vegetation may be more significant in affecting the eventual structure of the humic acids. (C) Williams & Wilkins 1995. All Rights Reserved.

Jin, X., Bailey, G.W., Yu, Y.S. and Lynch, A.T. (1996), Kinetics of single and multiple metal ion sorption processes on humic substances. *Soil Science*, **161** (8), 509-520.

Full Text: [1996\Soi Sci161, 509.pdf](1996/Soi%20Sci161,%20509.pdf)

Abstract: Single and multiple metal ion reaction processes were studied on humic acids (HA) from various sources, A sequential sampling method (samples periodically removed from the bulk reaction volume) was used. Experimental parameters studied included pH, temperature, HA and peat sources, metal type and concentration, The Langmuir-Hinshelwood (LH) kinetics approach was used to describe the sorption kinetics of metal ions onto HA. Great differences were found among the metals in the extent of reaction and sorption kinetics, The extent of reaction was Cr(III) > Pb(II) > Cu(II) > Ag(I) > Cd(II) = Co(II) = Li(I) for single metal adsorption and Cr(III) >> Pb(II) > Cu(II) = Ag(I) = Cd(II) = Co(II) Li(I) for multiple metal adsorption on Humic Acid No. 1. The multiple ion sorption kinetics were similar between HA from different sources, For peat reactions, the extent of multiple metal ion sorption was Cr(III) > Pb(II) > Cu(II) > Ag(I) > Co(II) = Cd(II) = Li(I).

The sorption rates of all metal ions on HA were very rapid, Most adsorption occurred within 2 minutes, but sorption did not reach equilibrium in 1 day under competitive conditions, The presence of Cr(III) greatly decreased the adsorption of all other metals to the extent that some were not adsorbed at all, For all metal ions studied, less total sorption of each metal ion occurred in the presence of multiple competing ions than with single metal ions.

Pearson’s Hard Soft Acid Base principles and Klopman’s generalized perturbation theory of chemical reactivity generally predicted the sorption preference between metal ions and humic substances, A nonlinearity concept was used to rationalize the use of the LH kinetic model.

López Piñeiro, A. and Navarro, A.G. (1997), Phosphate sorption in vertisols of southwestern Spain. *Soil Science*, **162** (1), 69-77.

Full Text: [1997\Soi Sci162, 69.pdf](1997/Soi%20Sci162,%2069.pdf)

Abstract: Low phosphorus availability is a critical impediment to agricultural use of Vertisols. Several studies have explored the P sorption characteristics of Vertisols, but few have investigated the relationship between soil physicochemical and the P sorption parameters calculated from uniform-surface and two-surface Langmuir equations, Phosphate sorption was investigated in surface-samples of 19 Vertisols in southwestern Spain. The phosphate sorption maxima (PAM) deduced from the uniform-surface Langmuir equation ranged from 150 to 2566 mg P kg-1, with a mean value of 1115 mg P kg-1. The calculated sorption maxima (TPAM) for the two-surface Langmuir model ranged from 410 to 15406 mg P kg-1, and the mean value (4296 mg P kg-1) increased about 3 times compared with the basic Langmuir equation, The two-surface Langmuir model fit the sorption data better than the uniform layer model, Therefore, an underestimation of the P-sorption was observed when the traditional Langmuir equation was used,Total surface area was highly correlated with sorption maxima: n = 0.708\*\*\* for PAM and 0.900\*\*\* for TPAM, For the two-surface equation, correlation analysis suggested that the “active” CaCO3 (ACCE) was the most active sorbent of P on the high energy sites, whereas citrate-dithionite-bicarbonate extractable Fe (Fe-d) contributed to P sorption on the low energy sites. The prediction of the PAM and TPAM was improved by combining all or several of following soil properties: Fe-d, ACCE, clay, and total surface area in a multiple-regression analysis. The equations obtained could offer a rapid estimation of P-sorption in Vertisols of southwestern Spain. Moreover, the results obtained from a greenhouse experiment with Agrostis tennuis and two levels of P (0 and 218 mg P kg-1) showed that the amount of available soil P was a positive function of Fed but a negative function for ACCE.

Keywords: Adsorption, Clay, Equation, Iron, Phosphate Sorption, Soils, Sorption, Two-Surface Langmuir

Ajwa, H.A. and Tabatabai, M.A. (1997), Metal-induced sulfate adsorption by soils: III. Application of Langmuir equations, *Soil Science*, **162** (3), 169-180.

Full Text: [1997\Soi Sci162, 169.pdf](1997/Soi%20Sci162,%20169.pdf)

Abstract: The one-and two-surface Langmuir equations were evaluated in studies of the effect of metal type, valence, and concentration on SO42-adsorption by four diverse soils, two from Iowa (dominated by permanent charge) and one each from Chile and Costa Rica (two highly weathered soils with variable charge). The adsorption parameters, Xm and k, calculated using the ‘one-surface’ Langmuir equation, showed that SO42-adsorption by the soils in the presence of trivalent metals was relatively higher than in the presence of mono-or divalent metals. When SO42-and metal were added at equivalent concentrations, the Xm values varied from 14.9 mmol (c)kg-1 for Rathbun soil when Cs+ was the metal ion to 303 mmol (c)kg-1 for Osorno soil when In3+ was the metal ion. The corresponding k values were 0.109 and 0.040, respectively. The Xm values for SO42-adsorption by the soils when the metals were added at a constant concentration (12.0 mmol (c)L-1) were, in general, less than those when SO42-and its metal ion were added at equivalent concentrations. At the constant initial metal concentration, the Xm values ranged from 10.0 mmol (c)kg-1 for Rathbun soil when K+ or Cs+ was the metal ion to 93.7 mmol (c)kg-1 for Osorno soil when In3+ was the metal ion. The corresponding k values were 0.163 (K+), 0.224 (Cs+), and 1.28 (In3+). The calculated parameters (Xm1, k1, Xm2, and k2) of the ‘two-surface’ Langmuir equation for the SO42-adsorption data of the two Iowa soils with predominant permanent charge showed that this equation gave one line instead of two when SO42-and metals were added at equivalent concentrations, suggesting that, in the range of SO42-concentration used, one type of adsorption site or mechanism was involved. The two-surface Langmuir equation adequately described SO42-adsorption data when the initial metal concentration was constant. The estimated adsorption maximum (Xm1 + Xm2) values by the ‘two-surface’ Langmuir equation were always greater than those estimated by the ‘one-surface’ Langmuir equation when the metal ions were added at a constant concentration. For all the SO42-adsorption data, two bonding constants were found, suggesting the presence of two different adsorption sites or different mechanisms, each with a different bonding energy. The results provide evidence that SO42-adsorption by soils is caused by more than one mechanism and that the associated metal ion significantly affects SO42-adsorption, regardless of the mechanism involved.

Keywords: Isotherms, Phosphate Adsorption, Sorption, Two-Surface Langmuir

Houng, K.H. and Lee, D.Y. (1998), Comparisons of linear and nonlinear Langmuir and Freundlich curve-fit in the study of Cu, Cd, and Pb adsorption on Taiwan soils. *Soil Science*, **163** (2), 115-121.

Full Text: [1998\Soi Sci163, 115.pdf](1998/Soi%20Sci163,%20115.pdf)

Abstract: In the Langmuir adsorption equation, q = MbC, (1+bC), the b parameter can be identified as the reciprocal of the concentration, C-1, 2, at which the adsorbent is half-saturated with the adsorbate. If the concentration, C, is scaled in the unit of C-1, 2, and replaced the C’, where C’ = C, C-1, 2, the universal dimensionless Langmuir equation, theta = C’, (1+C’), is obtained, Arbitrary points chosen on segments of the normal Langmuir plot can be fitted to different Freundlich equations with statistical significance. This indicates that the Freundlich equation can be applied to represent a selected range of the adsorption data that also fit the Langmuir equation. Linear and nonlinear least squares methods were applied to fit experimental data of adsorption of a metal ion in the presence of another metal ion, on three Taiwan soils, to Langmuir and Freundlich equations. The goodness-of-fit of the model to the experimental data was compared with the magnitude of the residual root mean square error (RMSE) of the original nonlinear forms of both adsorption isotherms. Results indicate that simple conclusions, based on the R-2 values obtained by the usual linear least squares method applied to the linearly transformed equations, may be in error. Even when the metal ion adsorption on soils appeared to be better represented by the Freundlich equation,judging from the size of the R-2 value, than by the Langmuir equation, there are cases in which the Langmuir equation could better represent the experimental data based on the size of RMSE value,These were examples of experiments conducted in a limited concentration range, Increasing the range of concentration for the adsorption experiments may eventually turn the Freundlich-type adsorption isotherms into the Langmuir type if no complication arises in the more concentrated solutions.

Keywords: Adsorption, Adsorption Isotherms, Curve-Fitting, Estimating Michaelis-Menten, Freundlich Model, H System, Hematite, Isotherm Constants, Langmuir Model, Least-Squares, Phosphate Sorption, Zinc

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Full Text: S[1998\Soi Sci163, 278.pdf](1998/Soi%20Sci163,%20278.pdf)

Abstract: Arsenic toxicity, mobility, and bioavailability in soil-water systems are highly dependent on its oxidation states and chemical species. In this study, both indirect (FTIR) and direct (X-ray Absorption Near Edge Structure (XANES)) spectroscopic techniques mere applied to investigate the adsorption and oxidation of As(III) on the surface of goethite, The results indicate that: at low pH, the As(V)/As(III) ratio in the solid phase is higher than in the solution phase. As(III) adsorbed on goethite under air dry conditions was not stable. After 20 days, more than 20% of adsorbed. As(III) was oxidized to As(V), Birnessite was an active oxidant of As(III), both in solutions and on the goethite surface, This study suggests that the adsorption-oxidation system composed of goethite and birnessite map be significant in decreasing arsenic toxicity in terrestrial environments.

Keywords: FTIR, Xanes, Arsenate, Arsenite, Adsorption, Oxidation, Goethite, Birnessite, Deuteration, Amorphous Iron Hydroxide, Arsenate, Birnessite, As(III), Speciation, Manganese, Sediments, Removal, Waters, Oxides

Hinz, C. and Selim, H.M. (1999), Kinetics of Zn sorption-desorption using a thin disk flow method. *Soil Science*, **164** (2), 92-100.

Full Text: [1999\Soi Sci164, 92.pdf](1999/Soi%20Sci164,%2092.pdf)

Abstract: In this study we investigated the kinetics of Zn sorption and desorption using a short column or thin disk method. The method is based on continuous now through a thin soil layer (1 mm) where the effluent was collected using a fraction collector. Two soils were used: a Windsor soil and Mahan soil, Breakthrough results (BTCs) for different now velocities indicated that Zn sorption is instantaneous and equilibrium retention is dominant when a pulse of Zn with a concentration of 2.62×10-5 M is applied. However, based on now interruption, time-dependent Zn sorption-desorption processes were most pronounced when the applied Zn pulse concentration was two orders of magnitude lower (2.51×10-7 M), This confirms earlier findings of concentration-dependent kinetics from batch experiments on Windsor soil (Hinz et al., 1992), The removal of organic matter and iron oxide, based on peroxide and peroxide/dithionite-treatments, resulted in doubling and quadrupling Zn retention, respectively, compared with the untreated Windsor soil. Differences between the untreated, peroxide-, and peroxide/dithionite-treated Windsor soils were most pronounced at low input Zn concentrations, suggesting that more specific sites became available as a result of the different treatments. At high input Zn concentrations, increases of specific sites may not be significant. For the treated soil, stronger sorption and desorption kinetic behavior was exhibited compared with the untreated soil. Diffusion into soil minerals or surface-controlled reactions may cause such behavior.

Keywords: Transport, Heavy Metals, Organic Matter, Iron Oxides, Organic-Matter, Soil, Adsorption, Exchange, Equilibrium, Cadmium, System, Oxide, Zinc, Iron

Zehetner, F. and Wenzel, W.W. (2000), Nickel and copper sorption in acid forest soils. *Soil Science*, **165** (6), 463-472.

Full Text: [2000\Soi Sci165, 463.pdf](2000/Soi%20Sci165,%20463.pdf)

Abstract: Five acid forest soils of eastern Austria were used to study nickel and copper sorption at metal concentrations ranging over five orders of magnitude. Distribution coefficients were calculated, and the Langmuir equation was fitted to the experimental isotherm data.

Exchange for mono- and divalent cations is considered the primary mechanism of Ni sorption, whereas complexation on organic surfaces may contribute significantly to Cu sorption in the studied soils. Organic matter is considered the most effective sorbent in topsoils, while sorption in subsoils may involve primarily Mn-oxide and clay mineral surfaces. The soils studied showed higher affinity for Cu than for Ni, however, at low metal levels, competitive complexation of Cu with soluble organic compounds counteracted sorption in topsoil horizons.

Using the van Bemmelen-Freundlich equation, general sorption density isotherms were developed for the studied soils. For Ni, similar fits were obtained by using specific surface area (SSA) and cation exchange capacity (CEC) as reference quantities, however, the quality of fit was improved when only the proportion of CEC occupied by mono- and divalent cations (CEC2+) was used as a reference. For Cu, the surface area-based approach yielded a better fit than the charge-based isotherms. Comparison with independent datasets from the literature showed good agreement with the proposed general sorption density isotherms, suggesting general applicability for acid soils of varying origin and composition.

Keywords: Nickel, Copper, Sorption, Isotherm, Langmuir, Freundlich, Heavy-Metal Deposition, West-Germany, Adsorption, Cadmium, Precipitation, Isotherms, Cobalt, Ions, Peat

Namjesnik-Dejanovic, K., Maurice, P.A., Aiken, G.R., Cabaniss, S., Chin, Y.P. and Pullin, M.J. (2000), Adsorption and fractionation of a muck fulvic acid on kaolinite and goethite at pH 3.7, 6, and 8. *Soil Science*, **165** (7), 545-559.

Full Text: [2000\Soi Sci165, 545.pdf](2000/Soi%20Sci165,%20545.pdf)

Abstract: Molecular weight (MW) of humic materials is a key factor controlling proton and metal binding and organic pollutant partitioning. Several studies have suggested preferential adsorption of higher MLW, more aromatic moieties to mineral surfaces, quantification of such processes is fundamental to development of predictive models, We used high pressure size exclusion chromatography (HPSEC) to quantify MW changes upon adsorption of a muck fulvic acid (MFA) extracted from a peat deposit to kaolinite and goethite, at pH 3.7, 6, and 8 at 22°C, I = 0.01 (NaCl), 24-h reaction time. MFA adsorption affinity was greater for goethite than for kaolinite, At concentrations less than the adsorption maximum (A(max)) for both adsorbents, the weight-average MW (M-w) of MFA remaining in solution decreased by as much as several hundred Daltons relative to control samples, indicating preferential adsorption of the higher MW components, At concentrations more than A(max), M-w of MFA in solution did not change appreciably, Although total adsorption decreased significantly as pH increased, fractionation as measured by change in M-w remained similar, perhaps indicating greater selectivity for higher MW components at higher pH, Absorptivities at lambda = 280 nm normalized to mg C L-1 (epsilon) suggested preferential adsorption of more aromatic moieties to kaolinite, epsilon could not be used for goethite-reacted samples because high Fe concentrations in the aqueous phase brought about by goethite dissolution interfered with the spectroscopic analysis, Preliminary kinetic experiments suggested that smaller molecules adsorbed first and were replaced by larger molecules whose adsorption was thermodynamically favored.

Keywords: Fulvic Acid, Kaolinite, Goethite, Adsorption, Aquatic Humic Substances, Dissolved Organic-Matter, Atomic-Force Microscopy, Spectroscopic Properties, Molecular-Weight, Polyacrylic-Acid, Water Interface, Surface-Charge, Natural-Waters, Iron-Oxides

? Selim, H.M. and Zhang, H. (2007), Arsenic adsorption in soils: Second-order and multireaction models. *Soil Science*, **172** (6), 444-458.

Full Text: [2007\Soi Sci165, 444.pdf](2007/Soi%20Sci165,%20444.pdf)

Abstract: Arsenic (As) is a toxic element, and the understanding of its retention in the soil environment is a prerequisite in predicting As behavior in the vadose zone. The objective of this study was to quantify the extent of the kinetics of As adsorption in soils over a wide range of concentrations and to investigate the capabilities of multireaction and a second-order modeling (MRM and SOM, respectively) approaches in describing the kinetic behavior of As in soils. Batch kinetic experiments were carried out to determine adsorption of As(V) over a wide range of concentrations by clay, loam, and sandy soils. Adsorption results indicated strongly kinetic behavior where the rate of As(V) retention was rapid initially and was followed by slow retention behavior with time. Sorption isotherms exhibited strong nonlinearity with a Freundlich reaction order much less than 1 for all soils. We tested the MRM and SOM for their capability to predict As concentration with time and found that several model versions fit the data equally well, but the sorption kinetics prediction capability varied among the soils investigated. MRM was superior to SOM, and the use of irreversible reaction into the model formulations was essential. In addition, we found that incorporation of an equilibrium-sorbed phase into the various model versions for As(V) predictions should be avoided.

Keywords: Adsorption, Adsorption-Desorption, Arsenic, As(V), Behavior, Cadmium, Chemistry, Clay, Concentration, Concentrations, Desorption, Environment, Ferrihydrite, Formulations, Freundlich, Goethite, Heavy Metals, Isotherms, Kinetic, Kinetics, Model, Modeling, Models, Multireaction Models, Nonlinearity, Order, Predict, Predicting, Prediction, Predictions, Range, Rate, Reaction, Reaction Order, Retention, Sandy Soils, Second Order, Soil, Soils, Som, Sorption, Sorption Kinetics, Toxic, Toxic Element, Transport, Vadose

? Xu, R.K., Kozak, L.M. and Huang, P.M. (2008), Kinetics of phosphate-induced desorption of arsenate adsorbed on crystalline and amorphous aluminum hydroxides. *Soil Science*, **173** (10), 683-693.

Full Text: [2008\Soi Sci173, 683.pdf](2008/Soi%20Sci173,%20683.pdf)

Abstract: Research on arsenate adsorption by Al hydroxides is common, however, relatively little is known on the kinetics of arsenate desorption from these Al hydroxides. The batch method was used to compare the phosphate-induced desorption kinetics of preadsorbed arsenate from the crystalline and amorphous Al(OH)3 at pH 5.0, background electrolyte of 0.01 M NaNO3 at 298 and 318 K. The results showed that both the amount of arsenate adsorbed by the amorphous Al(OH)3 and the mole fraction of arsenate remaining adsorbed on the amorphous Al(OH)3 after desorption were substantially greater than those in the crystalline Al(OH)3 system. The second-order rate equation was chosen to compare the rates of arsenate desorption. The rate constant of arsenate desorption from the crystalline Al(OH)3 was 3.8 to 15.5 times greater than that from the amorphous Al(OH)3 in the reaction period, suggesting that, compared with the crystalline Al(OH)3, the arsenate adsorbed on the amorphous Al(OH)3 was much more difficult to be desorbed by phosphate. The rate constant of arsenate desorption increased with the increase of phosphate concentration from 0.1 to 1.0 mM and the increasing temperature. Although the activation energy for arsenate desorption from the crystalline Al(OH)3 in the fast reaction was greater than that from the amorphous Al(OH)3, the much greater frequency factor for the desorption from the former resulted in a higher desorption rate of arsenate from the crystalline Al(OH)3. This information is of fundamental significance in understanding the dynamics of remobilization and fate of arsenate in soil and related environments. (Soil Science 2008,173:683-693).

Keywords: Activation, Activation Energy, Adsorption, Arsenate, Arsenite, Batch, Batch Method, Clay-Minerals, Competitive Adsorption, Concentration, Crystalline and Amorphous Al(OH)3, Desorption, Desorption Kinetics, Dynamics, Energy, Fate, Ferrihydrite, Goethite, Information, Kinetics, Oxide-Water Interface, pH, Phosphate, Rate Constant, Rates, Residence Time, Second Order, Second-Order, Selenite Desorption, Significance, Soil, Soils, Surface-Chemistry, Temperature, Understanding

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Subject Categories:

: Impact Factor

? Naganuma, K., Okazaki, M., Yonebayashi, K., Kyuma, K., Vijarnsorn, P. and Abubakar, Z. (1993), Surface-charge and adsorption characteristics of copper and zinc on tropical peat soils. *Soil Science and Plant Nutrition*, **39** (3), 455-462.

Full Text: [1993\Soi Sci Pla Nut39, 455.pdf](1993/Soi%20Sci%20Pla%20Nut39,%20455.pdf)

Abstract: The surface charges and the adsorption of copper (Cu) and zinc (Zn) on tropical peat soils which are poorly documented were investigated as a function of solution pH and Cu and Zn equilibrium concentrations. The point of zero charge of tropical peat soils from Malaysia and Thailand was lower than the original soil pHs. The adsorption of Cu and Zn remarkably increased with the increase of the solution pH and the equilibrium concentrations following the Langmuir adsorption isotherm equation. The adsorption of Cu on tropical peat soils was larger than that of Zn at the same pH value which was controlled with an automatic pH regulator. The relationship between the proton release and Cu and Zn adsorption was in the range of 1 to 2, suggesting that Cu and Zn replaced one or two protons from the sites with proton adsorption of tropical peat soils, although the proton consumption by hydrolytic Cu and Zn ions in the solution and dissociated carboxyl groups of tropical peat soils caused the decrease in the ratios of apparent release of the protons for Cu and Zn adsorption.

Keywords: Adsorption, Copper, Surface Charge, Tropical Peat Soils, Zinc, Organic-Matter, Ion-Exchange, Acid, Kinetics

? Yonebayashi, K., Pechayapisit, J., Vijarnsorn, P., Zahari, A.B. and Kyuma, K. (1994), Chemical alterations of tropical peat soils determined by waksman proximate analysis and properties of humic acids. *Soil Science and Plant Nutrition*, **40** (3), 435-444.

Full Text: [1994\Soi Sci Pla Nut40, 435.pdf](1994/Soi%20Sci%20Pla%20Nut40,%20435.pdf)

Abstract: The objective of this study is to analyze the chemical characteristics of tropical peat soils under natural swamp forest and their changes after reclamation. Peat soils were sampled from coastal swamps in southern Thailand and southern Peninsular Malaysia. These soils were at various stages of reclamation. The contents of water-soluble constituents in plant materials such as polysaccharides, tannins, and hemicellulose decreased with the soil depth due to leaching from subsoils below the water table. In the surface soil, readily decomposable organic constituents, namely polysaccharides, tannins, hemicellulose, and cellulose were decomposed and converted into humic acids during the first 5 y of reclamation. The humification degree of the newly formed humic acids increased in the succeeding 10 y of reclamation. Multiple regression of the pyrophosphate index, which reflects the decomposition stages of peat soils, and some other variables for their relevant characters were computed. Decreasing amounts of cellulose and lignin and increasing amounts of humic acids were found to be suitable variables for expressing the humification processes (r2 = 0.82). As a result of an NMR study, humic acids of tropical peat were considered to have long aliphatic chains, because they are likely to be partially derived from aquatic algae.

Keywords: Humic Acids, NMR, Reclamation of Peat Lands, Tropical Peat Soils, Waksman Proximate Analysis, Functional-Groups

? Nakahara, O. (1996), Reconsideration of theoretical basis of Freundlich adsorption isotherm equation. II. Approximative derivation. *Soil Science and Plant Nutrition*, **42** (1), 51-61.

Full Text: [1996\Soi Sci Pla Nut42, 51.pdf](1996/Soi%20Sci%20Pla%20Nut42,%2051.pdf)

Abstract: I constructed a modified surface complexation model that leads to the Freundlich isotherm approximately. The derivation of the Freundlich isotherm equation is based on the assumption that cations and anions are adsorbed onto the same surface simultaneously. This situation results in the formation of attractive forces between adsorbed cations and anions on the surface. Then the electrostatic energy of the surface should decrease with the increase of adsorption provided that the amount of the ion under consideration is smaller than that of the oppositely charged ion. By using the quadratic approximation theorem, me can approximate this electrostatic energy of quadratic polynomial: E(elec)(Freun)(n) = An(2)-Bn+C, by the following function: E(elec)(Freun)(n)(app) = D(nln(n/E)-n)+F, where n is the number of ions adsorbed, A, B, C, D, and E are constants with a positive value. Using this equation as the approximated electrostatic energy, we can deduce the Freundlich isotherm easily. This model provides a theoretical basis to the fact that heavy metal adsorption on the edge surface of layer silicate minerals often follows the Freundlich adsorption isotherm equation.

Keywords: Cation Adsorption on Andisols, Freundlich Isotherm, Heavy Metal Adsorption, Phosphate Adsorption, Surface Complexation Models Cadmium Sorption, Charge, Phosphate, Soils

# Title: Soil Science Society of America Journal

Soil Science Society of America Journal 1976-2000

Proceedings - Soil Science Society of America 1936-1975

Bulletin of the American Soil Survey Association 1921-1936

Title: Journal Soil Science Society of America

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? Ardakani, M.S. and Stevenso, F.J. (1972), Modified ion-exchange technique for determination of stability constants of metal-soil organic matter complexes. *Soil Science Society of America Journal*, **36** (6), 884-890.

Full Text: [1960-80\Soi Sci Soc Ame J36, 884.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J36,%20884.pdf)

Abstract: Calculation methods based on Schubert's ion-exchange equilibrium method were developed for determining stability constants of metal-soil organic matter complexes. The methods, which were free of certain assumptions and errors inherent in the ion-exchange technique as applied previously to soil organic matter, were verified using Mn(II)-citrate and Mn(II)-oxalate systems. Apparent stability constants (log K) of Zn (II)-humic acid complexes ranged from 3.13 to 5.13 at pH 6.5.

Notes: highly cited

? Biggar, J.W. and Cheung, M.W. (1973), Adsorption of picloram (4-amino-3,5,6-trichloropicolinic acid) on panoche, ephrata, and palouse soils - Thermodynamic approach to adsorption mechanism. *Soil Science Society of America Journal*, **37** (6), 863-868.

Full Text: [1960-80\Soi Sci Soc Ame J37, 863.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J37,%20863.pdf)

Abstract: The adsorption of picloram (4-amino-3,5,6-trichloropicolinic acid) was studied on Panoche clay loam (at pH 4.2 and 1.2), Ephrata sandy loam, and Palouse silty loam. The adsorption processes could be described by the Freundlich equation with Freundlich constants, K, 1/n, and percentage of adsorption at 25C: respectively, 0.210, 0.92, and 3–5.6% for Panoche at pH 4.2, 2.5, 0.93, and 30% for Panoche at pH 1.2, 0.172, 0.99, and 1.9–3.6% for Ephrata, and 1.74, 0.92, and 26–33% for Palouse. Also evaluated were the standard free energy, entropy, and enthalpy associated with the adsorption processes. The values of ΔG° (kcal/mol), ΔS° (cal/mol per degree), and ΔH° (kcal/mol) were: respectively, −1.2±0.1, −14±2, and −5.3±0.6 for Panoche at pH 4.2, −2.98±0.05, −59±2, and −20±1 for Panoche at pH 1.2, −1.80±0.06, −24±3, and −9±1 for Ephrata, and −3.11±0.05, −3.3±1.5, and −4.1±0.4 for Palouse. Thermodynamic parameters were useful in assigning adsorption mechanisms to the four picloram-adsorbent-water systems.

? Griffin, R.A. and Jurinak, J.J. (1973), Test of a new model for kinetics of adsorption-desorption processes. *Soil Science Society of America Journal*, **37** (6), 869-872.

Full Text: [1960-80\Soi Sci Soc Ame J37, 869.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J37,%20869.pdf)

Abstract: A new model for the kinetics of adsorption-desorption processes proposed by Lindstrom, Haque, and Coshow (1970) was tested with adsorption and desorption data for the interaction of phosphate with the calcite mineral surface. The model was found to offer considerable advantages in speed and convenience to those users whose experimental conditions correspond to the assumptions inherent in the derivation of the model. There was reasonable agreement between the predicted adsorption kinetic parameters and experimental data. However, considerable disparity was observed between predicted and experimental desorption parameters. It was concluded that the model was not valid for endothermic processes.

? Kuo, S. and Lotse, E.G. (1976), Kinetics of phosphate adsorption and desorption by lake sediments. *Soil Science Society of America Journal*, **38** (1), 50-54.

Full Text: [1960-80\Soi Sci Soc Ame J38, 50.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J38,%2050.pdf)

Abstract: The objectives of the present investigation were to gain information on the rate and extent of phosphate adsorption and desorption and the energy of phosphate adsorption by lake sediments, and to evaluate the influence of the sediments on the phosphorus status of lake waters. While phosphate adsorption by sediments from Sebasticook Lake, Maine, could be described by the Freundlich equation over a large phosphorus concentration range, the Langmuir equation provided a good fit to the experimental data only at low phosphorus concentrations. The deviation from the Langmuir isotherm at high phosphorus concentrations was explained by an increase in total negative potential of the surface due to phosphorus adsorption and increased interaction between adsorbate molecules. The rate of phosphorus adsorption by the sediments could be described by the equation X = KC0t1/m. The calculated activation energy was 2.7 kcal/mole. The desorption of phosphorus from minerals and sediments was dependent on the anionic species present in the solution. The replacing power of the anions appeared to be related to their ionic potential and complexing ability. The rate of phosphorus desorption could be described by the proposed kinetic equation.

? Ardakani, M.S., Schulz, R.K. and McLaren, A.D. (1973), A kinetic study of ammonium and nitrite oxidation in a soil field plot. *Soil Science Society of America Journal*, **38** (2), 273-277.

Full Text: [1960-80\Soi Sci Soc Ame J38, 273.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J38,%20273.pdf)

Abstract: Disappearance of NH4+ from percolating solution in a 40 m2 plot is at first attributable to both oxidation and to adsorption by the soil. Once a steady state was established and exchangeable NH4+ was equilibrated with NH4+ in soil solution, oxidation alone accounted for disappearance of NH4+ — N in the top 2.5 cm of the soil. Concentration profiles of NO2- and NO3- are described by a modified Michaelis-Menten equation. Rate constants for oxidation of NO2- → NO3- and NH4+ → NO2- are 0.6 × 10-3 and 2.5 × 10-3 ppm/hour·cm3 per bacterium, respectively. These rates are in good agreement with the values found under controlled laboratory conditions.

? Munns, D.N. and Fox, R.L. (1976), Slow reaction which continues after phosphate adsorption: Kinetics and equilibrium in some tropical soils. *Soil Science Society of America Journal*, **40** (1), 46-51.

Full Text: [1960-80\Soi Sci Soc Ame J40, 46.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%2046.pdf)

Abstract: Dissolved phosphate was mixed with topsoil samples, and the decline in solution phosphate concentration (P) was followed for 200–300 days by periodically shaking and extracting subsamples with 1 or 10 mM CaCl2 (1:10). During the first 20–40 days, (P) declined faster in soil suspensions that were being shaken than it did in undisturbed soil at 0.1 bar moisture. After 40 days of reaction, shaking time had little effect. The slow fixation had first-order kinetics with respect to (P). The relative rate was faster in an Andept than in three Oxisols. It was unaffected by lime, though lime increased the strength of adsorption. Equilibrium was achieved at 50 days in an Andept and 100–200 days in three Oxisols. At equilibrium, the amount of adsorbed phosphate remaining labile was estimated from values of (P), using 6-day adsorption isotherms. Labile phosphate so estimated amounted to 30–50% of the added phosphate, implying that the residual value of phosphate added to these soils should be substantial and permanent except for removal by crops and erosion. Desorption isotherms diverged from adsorption isotherms less markedly with increasing time after phosphate addition, as if the slow reaction caused much of the apparent hysteresis.

Enfield, C.G., Harlin, Jr., C.C. and Bledsoe, B.E. (1976), Comparison of five kinetic model for orthophosphate reactions in mineral soils. *Soil Science Society of America Journal*, **40** (2), 243-249.

Full Text: [1960-80\Soi Sci Soc Ame J40, 243.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%20243.pdf)

Abstract: The kinetics of orthophosphate sorption with 25 mineral soils have been experimentally measured under laboratory conditions. The 25 mineral soils represent a wide range of physical and chemical properties. Regression analyses have been performed fitting the experimental data to five kinetic models. The five kinetic models include: a linearized first-order sorption, a first-order Freundlich sorption, an empirical function, a diffusion-limited Langmuir sorption, and a diffusion-limited Freundlich sorption. Mean correlation coefficients of 0.81, 0.83, 0.84, 0.86, and 0.88 were obtained for the models, respectively.

? Kohl, D.H., Vithayathil, F., Whitlow, R., Shearer, G. and Chien, S.H. (1976), Denitrification kinetics in soil systems: The significance of good fits of data to mathematical forms. *Soil Science Society of America Journal*, **40** (2), 249-253.

Full Text: [1960-80\Soi Sci Soc Ame J40, 249.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%20249.pdf)

Abstract: The loss of NO3- added to two central Illinois soils was determined in experiments in which the soils were incubated under waterlogged conditions. The loss was measured as a function of substrate concentration in one experiment in which samples were incubated for a single time (24 hours) and as a function of time in a second experiment in which the concentration of the added NO3- was held constant (200 ppm NO3--N). The rate of loss of NO3- was about 5.5 times higher in one of the soils than in the other. This difference was largely overcome by the addition of glucose (1% with respect to the soil) which also greatly enhanced the rate of denitrification in both soils. The experimental points representing the rate of NO3- loss plotted as a function of the concentration of added NO3-, were equally well fit by Michaelis-Menten and exponential equations as well as by the solution to a pair of nonlinear differential equations representing a system in which the product of one reaction (e.g., the reductant generated by the oxidation of carbon compounds) is a substrate in a second sequence (e.g., the denitrification of NO3-). The significance of such fits is discussed. The authors point out that while such fits have certain uses, it is not possible to infer from them the mechanism of the reaction.

Munn, D.A., Wilding, L.P. and McClean, E.O. (1976), Potassium release from sand, silt and clay soil separates. *Soil Science Society of America Journal*, **40** (3), 364-366.

Full Text: [1960-80\Soi Sci Soc Ame J40, 364.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%20364.pdf)

Abstract: Four Ohio soils of divergent mineralogy were fractionated into sand, silt, and clay-sized separates after dispersion with an ultrasonic probe. Samples were extracted for 10 days with 0.01M CaCl2 with the solution being changed each day. There was a wide range in daily and cumulative K release among the four soils for the same particle size and for different particle sizes within the same soil. When weighted according to particle size distribution of the soil, the clay was found to contribute 30–74%, silt 24-56%, and sand 3–21% of the total K released by the sum of the three separates. In all four soils, the clay separate released the most K per unit weight. The apparent rate constants for K release from the sand and clay separates were similar and renerally higher than that for the silt separates.

Stevenson, F.J. (1976), Stability constants of Cu2+, Pb2+ and Cd2+ complexes with humic acids. *Journal Soil Science Society of America*, **40** (5), 665-672.

Full Text: [1960-80\Soi Sci Soc Ame J40, 665.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%20665.pdf)

Abstract: Application was made of the potentiometric titration method for determining apparent stability constants for the complexes between Cu2+, Pb2+, and Cd2+ and three humic acids from diverse sources. Complexes of Cu2+ and Pb2+ were considerably more stable than those for Cd2+. Log K2 values, obtained from the relationship kj = bj/Ki (Ki = ionization constant) increased rather dramatically with decreasing salt concentration and were of the order of those reported in the literature for metal complexes with known biochemical compounds. Average log K2 values for the three humic acids (absence of neutral salts) were 8.9 for Cu2+, 8.7 for Pb2+, and 6.9 for Cd2+. Differences between humic acids in their ability to bind metal ions were slight. At least two major sites were involved in the binding of metal ions.

Notes: highly cited

Kinniburgh, D.G., Jackson, M.L. and Syers, J.K. (1976), Adsorption of alkaline earth, transition and heavy metal cations by hydrous oxide gels of iron and aluminium. *Journal Soil Science Society of America*, **40** (5), 796-799.

Full Text: [1960-80\Soi Sci Soc Ame J40, 796.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J40,%20796.pdf)

Abstract: Freshly precipitated Fe and Al gels (points of zero change at pH 8.1 and 9.4, respectively) strongly specifically adsorb divalent cations from 1M NaNO3 solution. Adsorption from a mixed solution of eight divalent cations (each 0.125×10-3 M) in suspensions of freshly precipitated Fe and Al gels (0.093M with respect to Fe or Al) was measured as a function of pH in 1M NaNO3. The selectivity sequence (lower pH = greater selectivity) for the retention of the alkaline earth cations by Fe gel was Ba > Ca > Sr > Mg, but for the Al gel was Mg > Ca > Sr > Ba. The selectivity sequence (Figures in parentheses indicate pH ± 0.2 for 50% retention) for the Fe gel was: Pb (3.1) > Cu(4.4) > Zn(5.4) > Ni(5.6) > Cd(5.8) > Co(6.0) > Sr(7.4) > Mg(7.8), whereas the sequence for the Al gel was: Cu(4.8) > Pb(5.2) > Zn(5.6) > Ni(6.3) > Co(6.5) > Cd(6.6) > Mg(8.1) > Sr(9.2). Significant adsorption occurred even when the extent of cation hydrolysis was much < 1%, and invariably occurred at a pH lower than that for hydroxide precipitation. Although the adsorption-pH sequences are related to cation hydrolysis and hydroxide precipitation pH values, the relationship is far from perfect, as is evidenced by the different sequences for the two gels. On aging of the Al gel in the presence of alkaline earth cations, the retention of Mg increased, while that of Ca, Sr, and Ba decreased. This result was thought to result from the structural incorporation of some Mg and the exclusion of the other cations.

Chien, S.H. (1977), Dissolution rates of phosphate rocks. *Soil Science Society of America Journal*, **41** (3), 656-657.

Full Text: [1960-80\Soi Sci Soc Ame J41, 656.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J41,%20656.pdf)

Abstract: The activity concept of phosphate-rock solubility was tested kinetically with three phosphate rocks covering a wide range of solubility. Two approaches were used: a single extraction solution of low solid/solution ratio (0.2 g/500 ml) and successive extractions at a high ratio (5 g/500 ml). The solution used was 1N NH4OAc (pH 4.8). The results showed that the phosphate rocks differed in their solubility and each rock apparently contained two fractions which differed in solubility. The rate constant was found to depend on the degree of carbonate substitution for phosphate in apatite structure and the solid/solution ratio used.

Reddy, K.R., Patrick, Jr., W.H. and Phillips, R.E. (1978), The role of nitrate diffusion in determining the order and rate of denitrification in flooded soil: I. Experimental results. *Soil Science Society of America Journal*, **42** (2), 268-272.

Full Text: [1960-80\Soi Sci Soc Ame J42, 268.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J42,%20268.pdf)

Abstract: Precipitates were formed by titrating dilute, acidic solutions of monomeric silicic acid [Si(OH)4] and copper (Cu) or zinc (Zn) to various pH values. Those containing Cu formed above pH 6.0, those containing Zn formed above pH 7.0. Periodically, during 2 years of aging in their mother liquor, the liquid phase was sampled and analyzed and the Cu/Si or Zn/Si molar ratios of the precipitates calculated. The Cu/Si ratios of those containing Cu stabilized readily near 0.78 and were unaffected by pH. The Zn/Si ratios of the Zn-containing precipitates, however, changed as a result of Si enrichment from near 1.80 soon after their formation to near 0.80 after aging 2 years. The systems with the lowest pH changed first and most rapidly and became stabilized within 6 months, those above pH 8.0 changed more slowly. The Zn-containing precipitates gave diffuse X-ray diffraction patterns indicative of a 2:1 layer silicate, whereas those containing Cu were amorphous.

? Zasoski, R.J. and Burau, R.G. (1978), Technique for studying kinetics of adsorption in suspensions. *Soil Science Society of America Journal*, **42** (2), 372-374.

Full Text: [1960-80\Soi Sci Soc Ame J42, 372.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J42,%20372.pdf)

Abstract: Experimental techniques are described for study of both the kinetics and equilibria of metal sorption in colloidal managanese dioxide suspensions. The techniques and apparatus appear not to contaminate the reactants or to sorb metal ions onto the reaction vessel walls, even at pH’s as high as 8 and metal concentrations in parts per billion. Products and reactants can be monitored simultaneously, and a complete accounting made of the ions thought to participate in the reaction. This system allows description of the sorption process from mixing to equilibrium. Repeated sequential sampling does not alter the ratio of solution to suspension, and accurate equilibrium data can be obtained from kinetic experiments over extended periods.

Bar-Yosef, B. and Kafkafi, U. (1978), Phosphate desorption from kaolinite suspensions. *Soil Science Society of America Journal*, **42** (4), 570-574.

Full Text: [1960-80\Soi Sci Soc Ame J42, 570.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J42,%20570.pdf)

Abstract: Phosphate desorption from soil minerals is one of the factors which determine the rate of P uptake by plants. Under laboratory conditions desorption is usually obtained by drastic dilution or leaching of the clay, thus inducing its dissolution. The objective of this work was to study the effect of the desorption method used, equilibration time and the dissolved silica on the desorption of P from kaolinite. Two desorption methods were used: (i) diluting 1% suspensions by various volumes of the same electrolyte, and (II) immersing a dialysis tube containing 0.25% suspension (+P) in an identical suspension initially free of P. The desorption process in both cases could be divided into a rapid and a slow first-order reaction. The rapid reaction rate constant was similar in both systems (about 4.65×10–3 hours–1 at 25°C). The slow reaction constants were 0.3×10–3 hours–1 and 1.15×10–3 hours–1 for cases (i) and (II), respectively. The activation energy of the desorption process in case (II) was 16.2 Kcal/mole for the rapid and 4.8 Kcal/mole for the slow reaction. The amount of silica dissolved from kaolinite due to dilution with 0.01M KCl depended on the dilution ratio and reached 16 mg SiO2/g kaolinite when the suspension was diluted 100-fold. Readsorption of part of the dissolved silica is stipulated to contribute to the fast P desorption process.

? Rao, P.S.C. and Davidson, J.M. (1978), Non-equilibrium conditions for ammonium adsorption-desorption during flow in soils. *Soil Science Society of America Journal*, **42** (4), 668-668.

Full Text: [1960-80\Soi Sci Soc Ame J42, 668.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J42,%20668.pdf)

? Shayan, A. and Davey, B.G. (1978), Universal dimensionless phosphate adsorption isotherm for soil. *Soil Science Society of America Journal*, **42** (6), 878-882.

Full Text: [1960-80\Soi Sci Soc Ame J42, 878.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J42,%20878.pdf)

Abstract: A unique dimensionless phosphate adsorption isotherm, covering the solution concentration range 10–6 to 10–1 M P, which has been found to fit 17 materials including 15 soils, pure kaolinite and amorphous Al(OH)3, is derived. The soils shown to fit the isotherm include chromic luvisols, pellic vertisols, calcic luvisols, a tropeptic eutrorthox, a volcanic ash soil from New Zealand, and a number of English soils. The necessary parameters to derive, a complete adsorption isotherm for a particular soil, from the universal isotherm, requires three adsorption experiments in the high concentration range (10–4 to 10–1 M P) to define the linear portion of the isotherm and the critical concentration. Three other determinations in the range 10–6 to 10–4 M P are needed to obtain the Freundlich isotherm from the data after correction for the effect of the linear region of the isotherm at high concentration. The Freundlich constant a was shown to be a capacity factor, and the constant b to be related to the chemical potential of the phosphate in solution. For the soils studied the variation in the magnitude of b was found to be smaller (0.11 to 0.37) than in a (1.60 to 9.66). The advantage of this universal isotherm over conventional isotherms, is that it requires less experimental work to define and is applicable over a wide range of P concentrations such as might be found surrounding a fertilizer granule.

Bloom, P.R. and McBride, M.B. (1979), Metal ion binding and exchange with hydrogen ions in acid-washed peat. *Soil Science Society of America Journal*, **43** (4), 687-692.

Full Text: [1960-80\Soi Sci Soc Ame J43, 687.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J43,%20687.pdf)

Abstract: Titration and electron spin resonance (ESR) studies of metal ion adsorption processes on acid peat were used to investigate metal-proton exchange. Localization of ions at carboxylate sites is suggested but the data indicate that chelation mechanisms or sites of greatly different acid strength need not be involved. The peat is observed to behave very much like synthetic cross-linked polycarboxylic acids in terms of metal ion adsorption. Most of the divalent ions adsorbed at acid pH appear to maintain a hydration sphere while the strongly immobilized Cu2+ ion coordinates directly with functional oxygens of the peat.

Sparks, D.L., Zelazny, L.W. and Martens, D.C. (1980), Kinetics of potassium exchange in a paleudult from the coastal plain of Virginia. *Soil Science Society of America Journal*, **44** (1), 37-40.

Full Text: [1960-80\Soi Sci Soc Ame J44, 37.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J44,%2037.pdf)

Abstract: The kinetics of K adsorption from solution to exchangeable phases were investigated on the Ap, A2, B21t, and B22t horizons of Dothan soil (Plinthic Paleudult) from two locations in Virginia. These soils are loamy sands in the upper horizons with clay content increasing with depth, are slightly acidic in the surface with pH decreasing with depth, have CEC’s ranging from 3.4 to 8.6 meq/100 g in the four horizons and contain considerable quantities of chloritized vermiculite and kaolinite in all horizons. Potassium adsorption with time was evaluated on Al- and Ca-saturated samples from each horizon using 5, 25, and 100 µg/ml K solutions equilibrated for 0, 1, 2, 24, 96, and 192 hours. Equilibrium in K exchange was reached in 2 hours with the 5 and 25 µg/ml solutions and in about 24 hours with the 100 µg/ml solution. This slow rate of K exchange was attributed to diffusion-controlled exchange, which reflects the relatively high amount of vermiculitic material in these soils. Adsorption rate coefficients (ka) were calculated from reaction time vs. quantity of K sorbed using a modified form of the Freundlich equation. The magnitude of the ka values decreased with increasing ionic strength, which conforms to Bronsted’s activity rate theory. The similar magnitude of the ka values from horizon to horizon suggests that similar exchange reactions were taking place in all horizons.

Chien, S.H., Clayton, W.R. and McClellan, G.H. (1980), Kinetics of dissolution of phosphate rocks in soils. *Soil Science Society of America Journal*, **44** (2), 260-264.

Full Text: [1960-80\Soi Sci Soc Ame J44, 260.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J44,%20260.pdf)

Abstract: A modified Elovich equation in the form of Ct = C0 – (1/ß)ln (ß) – (1/ß) ln t was derived to describe the kinetics of dissolution of three phosphate rocks (North Carolina, central Florida, and Tennessee) in three soils (one soil from Florida and two Nigerian soils). The equation fitted the experimental data the best among various models of kinetics. Comparisons of dissolution rates of various phosphate rocks in a given soil or a given phosphate rock in various soils can be made by comparing the values of three parameters—C0, and ß—in the equation where C0 is the maximum P concentration in the soil solution that a phosphate rock can provide in a soil (Ct is the P concentration at time t), and and ß are constants. It was found that C0 increased as increased and/or ß decreased in a given system. Temperature was found to have no significant effect on the dissolution of phosphate rock in the soil. This implies that phosphorus retention by the tropical soils treated with phospate rock may be much less affected by temperature as compared with water-soluble P fertilizers such as concentrated superphosphate.

Notes: highly cited

Chien, S.H. and Clayton, W.R. (1980), Application of Elovich equation to the kinetics of phosphate release and sorption in soils. *Soil Science Society of America Journal*, **44** (2), 265-268.

Full Text: [1960-80\Soi Sci Soc Ame J44, 265.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J44,%20265.pdf)

Abstract: Experimental data on the phosphate release and sorption in soils, when inadequately described by a first-order kinetic reaction, are often interpreted as a combination of two or three simultaneous first-order reactions. A simple modified Elovich equation in the form: q = (1/ß) ln (ß) + (1/ß) ln t was derived to fit the reported experimental data in literature that failed to conform to a single first-order kinetic equation. In this equation, q is the amount of phosphate released or sorbed, and and ß are constants. The equation successfully described the data as a single straight line that covers the entire course of reaction time. It also appears that constants of and ß may be used for comparison of reaction rates of phosphate release or sorption in different soils.

? Sposito, G. (1980), Derivation of the Freundlich equation for ion exchange reactions in soils. *Soil Science Society of America Journal*, **44** (3), 652-654.

Full Text: [1960-80\Soi Sci Soc Ame J44, 652.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J44,%20652.pdf)

Abstract: The Freundlich adsorption isotherm equation is derived rigorously for the trace adsorption of an ion participating in an exchange reaction. The derivation, which is an application of some general results obtained by R. Sips, is based on the assumption that the exchanger surface is heterogeneous and that each class of exchange sites adsorbs individually accordingly to the Langmuir isotherm. It is shown that, under these conditions, the Freundlich isotherm corresponds uniquely to a distribution of relative adsorption site affinities which is essentially log normal and that the empirical parameters in the Freundlich equation may be used to characterize the site distribution function mathematically, thus giving information about surface heterogeneity in the exchanger.

Sparks, D.L., Zelazny, L.W. and Martens, D.C. (1980), Kinetics of potassium desorption in soil using miscible displacement. *Soil Science Society of America Journal*, **44** (6), 1205-1208.

Full Text: [1960-80\Soi Sci Soc Ame J44, 1205.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20J44,%201205.pdf)

Abstract: Kinetics of K desorption were conducted on samples from the Ap, A2, B21t, and B22t horizons of two Dothan (Plinthic Paleudults) soils. Aluminum- and calcium- saturated samples were equilibrated with K for 96 hours and then continuously leached with 0.01M CaCl2 until K was not detected in the leachate. The rate of K desorption from all samples increased rapidly initially and levelled off with time. Desorption was nearly complete in approximately 3 to 4 hours for the Ap, A2, and B21t horizons, and in 8 to 9 hours for the B22t horizons. Approximately 95–98% of the adsorbed K was subsequently desorbed suggesting K adsorption-desorption in the Dothan soils was reversible. A linear relationship between time and percent K desorption indicated that diffusion was the predominant mechanism of K desorption in these soils. Diffusion-controlled exchange would be expected due to the vermiculitic clay minerals present in the soils. Potassium desorption conformed to first-order kinetics. Apparent desorption rate coefficients (k’d) ranged from 0.3 to 1.3 hour–1. The magnitude of the k’d values decreased as clay content increased in the soils. This was ascribed to increased intraparticle transport and to increased diffusion in the more clayey samples. The k’d values were generally higher in the Al-than in the Ca- saturated samples. The effect of flow velocity on rate of K desorption was investigated using velocities of 0.5, 1.0, and 1.5 ml min–1. The rate of K desorption increased only slightly with flow velocity.

? Sharpley, A.N., Ahuja, L.R., Yamamoto, M. and Menzel, R.G. (1981), The kinetics of phosphorus desorption from soil. *Soil Science Society of America Journal*, **45** (3), 493-496.

Full Text: [1981\Soi Sci Soc Ame J45, 493.pdf](1981/Soi%20Sci%20Soc%20Ame%20J45,%20493.pdf)

Abstract: The kinetics of P desorption for several soils was investigated at different water/soil ratios, during a short period of time, so that the results could be related to P release from agricultural soil to rainfall and runoff water. For all soils the logarithm of P release (Pd) was linearly related to the logarithm of contact time (t) at any given water/soil ratio (W) and P amendment and to logarithm of W at any given contact time and P amendment. The amount of P released was also directly proportional to the amount of desorbable P (Po) in the soil initially. The following simplified empirical model was developed to describe the desorption of soil P,

Pd = KPotWß,

where K, and ß are constants. The simplified model gave a reasonably good description of P desorption from five southwestern soils and provided similar values of the constants K, and ß, for each soil, over a range of experimental conditions. Consequently, we suggest that average values of the constants for each soil can be used in the model to describe P release for general applications.

Feigenbaum, S., Edelstein, R. and Shainberg, I. (1981), Release rate of potassium and structural cations from micas to ion exchanges in dilute solutions. *Soil Science Society of America Journal*, **45** (3), 501-506.

Full Text: [1981\Soi Sci Soc Ame J45, 501.pdf](1981/Soi%20Sci%20Soc%20Ame%20J45,%20501.pdf)

Abstract: The rate of release of K and structural cations from three micas (biotite, phlogopite, and muscovite) was measured in two-particle size ranges (5 – 20 µm and 20 – 50 µm), in dilute electrolyte solutions (0.001 N), and at pH 3.0 and 7.0. The rate of K release from phlogopite and biotite was similar to the rate of release of structural cations under acidic conditions and significantly higher under neutral conditions. These findings indicate that structural decomposition of phlogopite and biotite is dominant in acidic conditions, and that the role of interdiffusion increases in neutral conditions. Decomposition was more sensitive than interdiffusion to particle size. The rate of K-release from muscovite was about 5 and 15% that from biotite and phlogopite, respectively. The rate of K release from muscovite was higher than the rate of Al release. This indicates that muscovite is the most stable of the three micas and that the decomposition mechanism for K-release in muscovite was less important.

Sparks, D.L. and Jardine, P.M. (1981), Thermodynamics of potassium exchange in soil using a kinetics approach. *Soil Science Society of America Journal*, **45**, 1094-1099.

Full Text: [1981\Soi Sci Soc Ame J45, 1094.pdf](1981/Soi%20Sci%20Soc%20Ame%20J45,%201094.pdf)

Abstract: Thermodynamics of potassium (K) exchange using a kinetics approach was investigated in Ca-saturated samples from the Ap and B21t horizons of a Matapeake soil from Delaware. Kinetics of adsorption and desorption were determined at temperatures of 0, 25, and 40°C on each soil horizon using a miscible displacement technique. Energies of activation for adsorption and for desorption (Ea and Ed, respectively) ranged from 3.83 to 5.52 kcal mol-1. The Ed values were higher than the Ea values, indicating that more energy was needed to desorb K than to adsorb K. Thermodynamic and pseudothermodynamic parameters were determined using Gibbs’ and Eyring’s reaction rate theories. The free energy for K exchange (ΔG°) values were negative (ranging from 1,155 to 1,294 cal mol-1) and increased with increasing temperature. The free energy of activation values were higher for K desorption (ΔGd) than for K adsorption (ΔGa), suggesting a greater free energy requirement to desorb K. The excellent agreement between ΔG° calculated from Gibbs’ theory and from Eyring’s reaction rate theory indicated that pure thermodynamic parameters could be calculated using a chemical kinetics approach. The enthalpy (ΔH°) values were exothermic and indicated stronger binding of K’ ions in the B21t horizon than in the Ap horizon of the Matapeake soil. The latter was related to the difference in external surface-to-interlayer surface-charge ratio in the two horizons. The enthalpy of activation (ΔH++) values in both horizons were higher for desorption (ΔHd++), than for adsorption (ΔHa++), suggesting the heat energy required to overcome the K desorption barrier was greater than for that of K adsorption.

Boyd, S.A., Sommers, L.E. and Nelson, D.W. (1981), Copper(II) and iron(III) complexation by the carboxylate group of humic acid. *Journal Soil Science Society of America*, **45** (6), 1241-1242.

Full Text: [1981\Soi Sci Soc Ame J45, 1241.pdf](1981/Soi%20Sci%20Soc%20Ame%20J45,%201241.pdf)

Abstract: Infrared (IR) spectroscopy, between 2,000 and 1,000 cm–1, was used to identify the mode by which carboxylates of a soil humic acid (HA) complexed Cu2+ and Fe3+. Carboxylic acid groups of HA (R-COOH) were converted to carboxylates (R-COO-) by forming coordinate bonds with Cu2+ and Fe3+. The separation of the antisymmetrical and symmetrical stretching vibrations of R-COO- was obtained from the IR spectra of the metal-HA complexes. The values for the metal-HA complexes were significantly larger than the corresponding reference value of for uncomplexed -COO-, demonstrating that R-COO- formed a unidentate complex (i.e., a single M-O bond) with Cu2+ and Fe3+. The formation of bidentate or bridging complexes between R-COO- of HA and Cu2+ or Fe3+ was not observed.

Onken, A.B. and Matheson, R.L. (1982), Dissolution rate of EDTA-extractable phoaphate from soils. *Soil Science Society of America Journal*, **46** (2), 276-279.

Full Text: [1982\Soi Sci Soc Ame J46, 276.pdf](1982/Soi%20Sci%20Soc%20Ame%20J46,%20276.pdf)

Abstract: The kinetics of phosphorus (P) dissolution in EDTA (ethylenedi-aminetetraacetic acid) solution were investigated for several soils for the purpose of determining if the dissolution rate constants could be related to crop response to applied P. Eight kinetic models were evaluated using coefficients of determination (R2) and standard errors of estimate (SE). Additionally, the effects of temperature and soil-solution ratio on P dissolution in the EDTA solution were determined. Relatively high values of R2 and low values of SE indicated that P dissolution in EDTA solution for the soils used was most often best described by the two-constant rate equation, the Elovich-type equation, and the differential rate equation. None of the models best described the dissolution for all soils. Using R2 and SE for evaluation, the best relationships found between dissolution rate constants and yield response to applied P were for the two-constant rate equation (R2 = 0.97, SE = 2.58) and the differential rate equation (R2 = 0.95, SE = 2.69). Soil-solution ratio affected the values of dissolution rate constants, with those obtained from the differential rate equation most sensitive. The Arrhenius equation described reasonably well the effect of temperature on values of the dissolution rate constants.

Sparks, D.L. and Rechcigl, J.E. (1982), Comparison of batch and miscible displacement techniques to describe potassium adsorption kinetics in Delaware soils. *Soil Science Society of America Journal*, **46** (4), 875-877.

Full Text: [1982\Soi Sci Soc Ame J46, 875.pdf](1982/Soi%20Sci%20Soc%20Ame%20J46,%20875.pdf)

Abstract: Kinetics of potassium (K) adsorption in three soils were compared using batch equilibrium and miscible displacement techniques. The batch method reached equilibrium sooner than miscible displacement in all cases. Greater clay content did not affect the equilibrium time using the batch technique but increased that time for miscible displacement. The percent-K adsorption was closely related to (time)1/2 indicating diffusion-controlled exchange. Relative rate coefficients were significantly higher for batch than for miscible displacement. Miscible displacement simulates solute movement in soils under field conditions, and since flow rate and leachate volume can easily be adjusted, miscible displacement has great advantages for rapid reactions. Batch techniques require separation of solid and solution by centrifugation and/or filtration in which the time of separation of solid from liquid phases is not precisely known.

? Sposito, G. (1982), On the use of the Langmuir equation in the interpretation of adsorption phenomena. II. The two-surface Langmuir equation. *Soil Science Society of America Journal*, **46** (6), 1147-1152.

Full Text: [1982\Soi Sci Soc Ame J46, 1147.pdf](1982/Soi%20Sci%20Soc%20Ame%20J46,%201147.pdf)

Abstract: A rigorous, mathematical representation of a sorption isotherm as a Stieltjes transform is employed to prove a theorem about the “two-surface” Langmuir equation. This theorem states that, if the distribution coefficient for an ion sorbed by a soil is a finite, decreasing function of the amount sorbed, q, and extrapolates to zero at some finite value of q, then the sorption isotherm can always be represented mathematically by a two-surface Langmuir equation. Since the proof of this theorem does not depend on the chemical mechanism of ion sorption, it follows that the adjustable parameters in the two-surface Langmuir equation cannot be interpreted in terms of surface reactions without additional, independent evidence that only adsorption on two kinds of surface site actually is involved in the ion sorption reaction.

Notes: highly cited

? Harter, R.D. (1983), Effect of soil pH on adsorption of lead, copper, zinc, and nickel. *Soil Science Society of America Journal*, **47** (1), 47-51.

Full Text: [1983\Soi Sci Soc Ame J47, 47.pdf](1983/Soi%20Sci%20Soc%20Ame%20J47,%2047.pdf)

Abstract: Lead, copper, nickel, and zinc adsorption by and desorption from pH-adjusted soils has been studied. Surface and subsurface horizon samples of two soils were equilibrated with varying amounts of Ca(OH)2 prior to metal addition. The amount of all four metals retained was dependent upon pH of the soil sample, with retention dramatically increasing above pH 7.0 to 7.5. With the exception of Ni, at least 70 to 75% of the retained metal was extractable in 0.01N HCl. Nickel was somewhat less extractable, with that sorbed by the highest pH soils being the least extractable. Based on subsequent extractability, the soils used appeared to have specific adsorption sites for Pb, Ni, and Cu but little or none for Zn. These studies cast some doubt on the concept of pH management for immobilizing heavy metals placed on the land in that sorbed metals were substantially extractable by 0.01M HCl, which has been used to estimate plant availability of soil ions.

Sharpley, A.N. (1983), Effect of soil properties on the kinetics of phosphorus desorption. *Soil Science Society of America Journal*, **47** (3), 462-467.

Full Text: [1983\Soi Sci Soc Ame J47, 462.pdf](1983/Soi%20Sci%20Soc%20Ame%20J47,%20462.pdf)

Abstract: Relationships between the constants of a semilogarithmic modified Elovich and a logarithmic equation describing the kinetics of soil P desorption and physical and chemical properties of 60 soils, collected from throughout the USA, and volcanic ash were investigated. These relationships are needed for application of the equations to modeling soluble P transport in runoff from agricultural watersheds. The constants of the semilogarithmic equation (a and b) were significantly related to the extractable Al and CaCO3 content of acidic and basic calcareous soils, respectively. For the logarithmic equation, constants (K, α, and ß) were related to the ratio of Fe- or clay-organic C content of the acidic soils and CaCO3- or clay-organic C content of the basic calcareous soils. It is suggested that these ratios represent an index of interactive specific surface area involved with P adsorption-desorption for a given soil. In contrast to the logarithmic equation, constants of the modified Elovich equation varied with soil P status and water-to-soil ratio. Thus, the former equation may have a wide application to describing soil P desorption in water quality models.

Martin, H.W. and Sparks, D.L. (1983), Kinetics of nonexchangeable potassium release from two coastal plain soils. *Soil Science Society of America Journal*, **47** (5), 883-887.

Full Text: [1983\Soi Sci Soc Ame J47, 883.pdf](1983/Soi%20Sci%20Soc%20Ame%20J47,%20883.pdf)

Abstract: The kinetics of nonexchangeable-K release using H-saturated resin were investigated on Kalmia (fine-loamy, siliceous, thermic Typic Hapludults) and Kennansville (loamy, siliceous, thermic Arenic Hapludults) soil profiles from the Coastal Plain of Delaware. Calciumsaturated soil samples were equilibrated with H-saturated resin from 0.5 to 960 h. Equilibrium in K release in both soil profiles was attained in about 960 h. The kinetics of K release were evaluated using the Elovich, parabolic diffusion law, first-order diffusion, and zero-order equations. The first-order diffusion equation described the K-release kinetics best as evidenced by the highest correlation coefficient (r) and the lowest value of the standard error of the estimate (SE). The parabolic diffusion law also described the data satisfactorily indicating diffusion-controlled exchange. The zero-order and Elovich equations did not describe the data well as shown by higher SE values than those found with the first-order diffusion and parabolic diffusion law equations. Nonexchangeable-K release rate coefficients (k2) ranged from 1.20 to 2.2×10–3 h–1 in the Kalmia soil and from 1.5 to 2.9×10–3 h–1 in the Kennansville soil. The magnitude of the k2 values suggested low rates of nonexchangeable-K release from the two soils.

? Ratnerzohar, Y., Banin, A. and Chen, Y. (1983), Oven drying as a pretreatment for surface-area determinations of soils and clays. *Soil Science Society of America Journal*, **47** (5), 1056-1058.

Full Text: [1983\Soi Sci Soc Ame J47, 1056.pdf](1983/Soi%20Sci%20Soc%20Ame%20J47,%201056.pdf)

Abstract: Various procedures for drying soil and clay samples prior to surface area determination have been compared. The study was conducted on various soils—kaolinite, illite, and a number of minerals representing the smectite group. This research showed that 24 h of oven drying rather than P2O5 drying can be applied as a pretreatment for surface-area determinations of soils and clays by the ethylene glycol monoethyl ether (EGME) method with the exception of illite and illitic soils. Surface-area determinations following the two drying procedures were highly significantly correlated (at the 1% level) for smectites and soils, exhibiting coefficients of 0.996 and 0.986, respectively, between the oven- vs. P2O5 drying. Oven drying results in a 15% decrease in surface area of illite, suggesting that this procedure would not be recommended as a pretreatment for measurements on soils rich in illites. The oven drying procedure saves 4 to 5 d of the surface-area determination procedure and is applicable to smectites and soils rich in montmorillonite and kaolinite.

Jardine, P.M. and Sparks, D.L. (1984), Potassium-calcium exchange in a multireactive soil system: I. Kinetics. *Soil Science Society of America Journal*, **48** (1), 39-45.

Full Text: [1984\Soi Sci Soc Ame J48, 39.pdf](1984/Soi%20Sci%20Soc%20Ame%20J48,%2039.pdf)

Abstract: The kinetics of K exchange were investigated in Ca-saturated samples from the Ap horizon of an Evesboro soil from Delaware. Biphasic kinetics characterized the first-order plots for K adsorption and desorption at 283 and 298K with the two simultaneous reactions being attributed to exchange sites with varying reactivity for K and Ca ions. The rapid reaction was ascribed to exchange sites of the soil that are readily accessible to cation exchange reactions, whereas the slow reaction was attributed to exchange sites that are difficultly accessible to cation exchange reactions. Confirmation of the hiphasic kinetics was achieved through the use of cetyltrimethylammonium bromide (CTAB). Parabolic diffusion plots for K adsorption and desorption at 283 and 298 K indicated that an intraparticle diffusion process may be rate limiting for the difficultly accessible sites of the soil. The initial deviation from linearity of the parabolic plots for K desorption suggested that film diffusion may be rate limiting for desorption on readily accessible sites of the soil that form strong bonds with Ca ions. At 313 K the initial rapid kinetics of exchange was no longer present, and the exchange process was described by a single first-order reaction. The parabolic plots at 313 K suggested that this phenomenon could possibly be attributed to the finite rate at which the polymer structure of soil organic matter changes in response to the adsorption and desorption of the two reacting cations.

Jardine, P.M. and Sparks, D.L. (1984), Potassium-calcium exchange in a multireactive soil system: II. Thermodynamics. *Soil Science Society of America Journal*, **48** (1), 45-50.

Full Text: [1984\Soi Sci Soc Ame J48, 45.pdf](1984/Soi%20Sci%20Soc%20Ame%20J48,%2045.pdf)

Abstract: Thermodynamics of K exchange were investigated in Ca-saturated samples from the Ap horizon of an Evesboro soil from Delaware. At 283 and 298 K the selectivity curves (lnkv vs. K) showed preference for K at low values of NK (mole fraction of K in solution) and for Ca at higher values. This selectivity reversal may be attributed to exchange sites of varying reactivity for K and Ca ions and supports the hypothesis of the multireactive nature of the soil. Although K was selectively bound at low NK, the soil exhibited an overall Ca preference as noted by the positive standard free energy values (ΔG°). The standard enthalpy of exchange (ΔH°) was negative, which indicated very strong binding of K ions with some sites of the soil. This may be associated with the presence of vermiculitic clay minerals that predominated in the <2-µm clay fraction. A thermodynamic investigation was also initiated on the various size fractions of the soil (i.e., sand, silt, and clay) and on soil that was treated with cetyltrimethylammonium bromide (CTAB) or NaOCl-DCB. These treatments explained the differences in ionic selectivity observed in the Evesboro soil.

Sparks, D.L. (1984), Ion activities: An historical and theoretical overview. *Soil Science Society of America Journal*, **48** (3), 514-518.

Full Text: [1984\Soi Sci Soc Ame J48, 514.pdf](1984/Soi%20Sci%20Soc%20Ame%20J48,%20514.pdf)

Abstract: A knowledge of ion activities in soil-water systems is essential to a proper understanding of the physicochemical behavior of soils and to the environment of plant roots in the soil. However, with the notable exception of soil acidity, perhaps no other topic in soil chemistry has provoked such fierce arguments as the meaning of ionic activities as they apply to the soil solution. The purpose of this paper is to present an historical and theoretical overview of the use of ion activities in soil chemistry. Attempting to incorporate ionic species into a thermodynamic analysis of the soil solution is a convenient mathematical device, since an ionic species cannot be described in thermodynamic terms. Ionic species are strictly molecular or microscopic concepts. It is demonstrated in this paper that when ionic equilibria between aqueous solutions and solid phases are investigated, the division of the electrochemical potential into a term in electrical potential (ϕ) and a term in chemical potential (µ) is entirely arbitrary. Additionally, the early 1950s arguments of Jenny, Marshall, Peech, Coleman, Overbeek, and Babcock dealing with junction potentials, suspension effects, and mobilities of ions is reviewed. The importance of soil solution activities in relation to nutrient uptake and plant growth is also presented.

? Harter, R.D. (1984), Curve-fit errors in Langmuir adsorption maxima. *Soil Science Society of America Journal*, **48** (4), 749-752.

Full Text: [1984\Soi Sci Soc Ame J48, 749.pdf](1984/Soi%20Sci%20Soc%20Ame%20J48,%20749.pdf)

Abstract: Although the Langmuir equation does not always adequately estimate “adsorption” maxima, it remains useful for empirical description of data. The test of data fit to the equation has usually been by linearity of the “Langmuir plot,” viz. concentration/adsorption plotted as a function of concentration. This test, however, is inadequate because the plotting of concentration against itself reduces data variability and always provides a statistically significant correlation coefficient. A better test of fit is to ascertain whether the adsorption isotherm has the shape of the equation model. When isotherms do not have the correct shape and only low concentration data is used, the equation can provide estimates of the adsorption maximum that are in error by 50% or more.

? Polyzopoulos, N.A., Keramidas, V.Z. and Kiosse, H. (1985), Phosphate sorption by some alfisols of greece as described by commonly used isotherms. *Soil Science Society of America Journal*, **49** (1), 81-84.

Full Text: [1985\Soi Sci Soc Ame J49, 81.pdf](1985/Soi%20Sci%20Soc%20Ame%20J49,%2081.pdf)

Abstract: The one- and two-surface Langmuir, the Freundlich, and the Temkin isotherms were fitted to P sorption data for 14 representative alfisols of Greece. Each was found to describe P sorption by these soils with comparable success, with the Freundlich and the two-surface Langmuir isotherms being slightly superior. The Freundlich equation is characterized by simplicity of form, based on more realistic assumptions, and now capable of rigorous derivation. It can therefore be used in preference to the others, since its parameters, as those of the Langmuir equation, allow comparisons among soils.

Keywords: Soils, Phosphorus – Adsorption, Thermoanalysis – Applications, Red Mediterranean Soils, Adsorption Isotherms, P Sorption Data

Havlin, J.L. and Westfall, D.G. (1985), Potassium release kinetics and plant response in calcareous soil. *Soil Science Society of America Journal*, **49** (2), 366-370.

Full Text: [1985\Soi Sci Soc Ame J49, 366.pdf](1985/Soi%20Sci%20Soc%20Ame%20J49,%20366.pdf)

Abstract: Greenhouse and laboratory experiments were conducted to characterize the K supply and nonexchangeable K release kinetics in calcareous soils. Twelve soils were exhaustively cropped with alfalfa (Medicago sativa L.) in the greenhouse for 584 d (16 cuttings). Yield, K uptake, and changes in NH4OAc exchangeable K were monitored. Calcium resin extractable K was determined in the laboratory (7000 h extraction) on the <0.25 mm fraction of each soil. Nonexchangeable K release was calculated from the greenhouse and laboratory data. Cumulative K release to Ca-resin was mathematically described by a power function equation and the empirical constants releated to alfalfa yield, K uptake, and exchangeable K levels. Results indicated that clay soils had a long-term supply of plant available K while light-textured soils did not. After 16 cuttings the exchangeable K levels in the clay, loam, and sand textured soils declined 44, 33 and 58%, respectively. Both independent methods of measuring nonexchangeable K release were highly correlated with each other (r = 0.91). Potassium release was also highly correlated to initial NH4OAc-K and to cumulative or relative K uptake and yield. Intercept and slope constants of the power function kinetic equation were significantly correlated to alfalfa yield, K uptake, and initial exchangeable K. Results also indicated that the NH4OAc-K soil test was an adequate measure of long-term K supply in these soils.

Havlin, J.L., Westfall, D.G. and Olsen, S.R. (1985), Mathematical models for potassium release kinetics in calcareous soils. *Soil Science Society of America Journal*, **49** (2), 371-376.

Full Text: [1985\Soi Sci Soc Ame J49, 371.pdf](1985/Soi%20Sci%20Soc%20Ame%20J49,%20371.pdf)

Abstract: Potassium release from the coarse (20–50 µm), medium (5–20 µm) and fine silt (2–5 µm), and the coarse (2–0.2 µm) and medium-fine clay (<0.2 µm) fractions of six Great Plain soils was determined by successive extraction with Ca-saturated cation exchange resins. All soils contained primarily montmorillonite-mica minerals. Results indicated that 65 to 80% of the total K released in 7000 h of extraction time occurred in the clay (<2.0 µm) fraction. Four mathematical models (first-order rate, parabolic diffusion, power function, and Elovich) were used to describe cumulative K release. Comparisons of coefficients of determination (r2) and standard errors of the estimate (SE) indicated that the Elovich, power function, and parabolic diffusion equations adequately described cumulative K release, whereas the first-order rate equation did not. Rate constants for the three equations were highly correlated with mica content and relative alfalfa yield and K uptake. In the past, others have used complex equations containing three simultaneous first-order rate terms to describe K release, however, results reported herein show that simple one-term equations can be used.

? Ogwada, R.A. and Sparks, D.L. (1986), A critical-evaluation on the use of kinetics for determining thermodynamics of ion-exchange in soils. *Soil Science Society of America Journal*, **50** (2), 300-305.

Full Text: [1986\Soi Sci Soc Ame J50, 300.pdf](1986/Soi%20Sci%20Soc%20Ame%20J50,%20300.pdf)

Abstract: Thermodynamics of K-Ca exchange were compared using equilibrium and kinetic approaches in two Delaware soils. The classical Argersinger theory was employed for the equilibrium approach, while a kinetic approach was studied using miscible displacement, batch, and vigorously mixed batch techniques. These three techniques were used to determine how diffusion affects the comparison between thermodynamic parameters using kinetic and equilibrium approaches. Rate coefficients and energies of activation were profoundly affected by the type of kinetic technique employed and their magnitude was in the order: vigorously mixed batch > batch > miscible displacement. Energies of activation for adsorption (Eaa) in the two soils ranged from 7.42 kJ mol–1 using the miscible displacement technique to 32.96 kJ mol–1 with the vigorously mixed batch, while energies of activation for desorption (Ead) ranged from 11.87 to 42.1 kJ mol–1 for the two methods, respectively. The magnitude of the Eaa and Ead values indicated pronounced diffusion effects in the miscible displacement and batch techniques, which were greatly reduced with the vigorously mixed batch method. Thermodynamic parameters (ΔG°, ΔH°, and ΔS°) calculated using the equilibrium and kinetic approaches compared very well in trend, and gave the same inferences of ion behavior for the two soils studied. However, except for the vigorously mixed batch technique, the magnitude of the thermodynamic parameters for the two approaches compared poorly. For example, the ΔG° values calculated using the equilibrium approach avg 4.67 kJ mol–1 for the two soils, while they avg 4.92 kJ mol–1 with the vigorously mixed batch, 2.12 kJ mol–1 with the batch, and 2.12 kJ mol–1 with the miscible displacement. The degree of comparison between the two approaches was directly related to the extent of diffusion controlled exchange. When the influence of diffusion was significantly reduced, as with the vigorously mixed batch technique, our data would indicate that a kinetic approach can be successfully used to gather thermodynamic information about a soil system.

Jardine, P.M. and Zelazny, L.W. (1986), Momomuclear and polynuclear aluminum speciation through differential kinetic reactions with ferron. *Soil Science Society of America Journal*, **50** (4), 895-900.

Full Text: [1986\Soi Sci Soc Ame J50, 895.pdf](1986/Soi%20Sci%20Soc%20Ame%20J50,%20895.pdf)

Abstract: The kinetic reaction of ferron (8-hydroxy-7-iodo-5-quinoline-sulfonic acid) with partially neutralized Al solutions of varying basicity and age were investigated with the intent of separating mononuclear and polynuclear Al. Ferron solutions buffered with varying quantities of NaOAc, NH2OH·HCl, and acetic acid suggested that reduction of ferron by NH2OH·HCl may be essential before monotonically increasing absorbance vs. time functions occur for Al reactions with ferron. When ferron is buffered with appropriate quantities of NaOAc and NH2OH·HCl it must be aged for 5 d at room temperature until reduction has slowed. This solution remains stable for ≅25 d and exhibits consistent kinetic reactions with Al during this time period. A large portion of ferron interactions with partially neutralized Al of varying basicity and age were described by a binary species first-order rate function, which provided the rates of monomer and small polymer reactions with ferron as well as the mole fraction of monomeric species present (fa). Modelfitted fa are based on the differential kinetic reactions of ferron with Al, thus arbitrary separation times for determining mononuclear and polynuclear Al are avoided. Rate parameters established for mononuclear Al solutions using a single species first-order equation compared well with those determined for mononuclear Al from partially neutralized solutions using the binary species model. Ferron reactions at longer times were related to the decomposition of large Al polymers, which were welldescribed by pseudo first-order kinetics.

? Ogwada, R.A. and Sparks, D.L. (1986), Kinetics of ion exchange on clay minerals and soil. I. Evaluation of methods. *Soil Science Society of America Journal*, **50** (5), 1158-1162.

Full Text: [1986\Soi Sci Soc Ame J50, 1158.pdf](1986/Soi%20Sci%20Soc%20Ame%20J50,%201158.pdf)

Abstract: The effect of kinetic methodology on adsorption rate coefficients (ka) and energies of activation for adsorption (Eaa) were investigated using five different techniques. These techniques were: miscible displacement, batch, static, stirred, and vortex batch. Kinetics of K adsorption were studied on Ca-saturated kaolinite, a Chester soil (fine-loamy, mixed mesic Typic Hapludults) and vermiculite. The ka values were highest for kaolinite and lowest for vermiculite. The higher ka values observed for kaolinite would be expected since a relatively pure kaolin would exhibit only easily accessible planar surface sites for K exchange. The ka values for the Chester soil were a reflection of the intermediate properties of this soil between kaolinite and vermiculite. The type of kinetic technique greatly affected the time required for equilibrium to be attained in K adsorption. From greatest to least time, the order was: static > miscible displacement > batch > stirred > vortex batch. Both static and miscible displacement techniques yielded the lowest ka and Eaa values for all three colloids. This is primarily because these methods represent systems where the influence of diffusion on the rate of K adsorption is at its maximum. Only for kaolinite did the ka and Eaa values of both the stirred and batch techniques approximate, in magnitude, those of the vortex method. With the Chester soil and vermiculite, which contain appreciable interlayer sites, the stirred and batch techniques yielded ka and Eaa values much lower than those for the vortex batch method. These results indicate that in colloids where more significant intraparticle diffusion occurs, the batch or stirring technique as used in this study is not effective in eliminating the influence of diffusion.

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Full Text: [1986\Soi Sci Soc Ame J50, 1162.pdf](1986/Soi%20Sci%20Soc%20Ame%20J50,%201162.pdf)

Abstract: Kinetics of K+ adsorption were investigated on kaolinite, a Chester loam soil and vermiculite using static, stirred, and vortex batch techniques. The objective of this study was to elucidate the rate-limiting steps for K+ adsorption on the clay minerals and soil. We hypothesized that it is possible under laboratory conditions to set up a system in which the global rate is limited by mass transfer (under static conditions), in which only the intraparticle diffusion step is rate-limiting (stirred system), and a system in which the rates of film and intraparticle diffusion are both relatively rapid, presumably rendering the reaction step to be rate-controlling (vortex batch). We derived and assigned additive resistance relations to the three proposed experimental methods according to the above stated assumptions. Observed rate coefficients obtained from static, stirred and vortex batch systems were combined and used to calculate rate coefficients for film diffusion (kf), intraparticle diffusion (kI), and reaction kinetics (kr) in a static system. Film diffusion and intraparticle diffusion rate coefficients were approximately the same in vermiculite, indicating that both steps were rate-determining. In kaolinite and the Chester soil, film diffusion was the rate-limiting step. These conclusions were also verified using the parabolic diffusion equation. The kI values were on the avg 8.7 times as great as kf values in the kaolinite system, indicating that intraparticle diffusion was not important for kaolinite. Higher energies of activation for adsorption (Eaa) were observed for the reaction step than for intraparticle diffusion or film diffusion steps. These findings were expected since chemical reactions are more sensitive to temperature changes than diffusion processes.

? Schulthess, C.P. and Sparks, D.L. (1986), Back-titration technique for proton isotherm modeling of oxide surfaces. *Soil Science Society of America Journal*, **50** (6), 1406-1411.

Full Text: [1986\Soi Sci Soc Ame J50, 1406.pdf](1986/Soi%20Sci%20Soc%20Ame%20J50,%201406.pdf)

Abstract: Batch potentiometric titration analyses were made on a γ-Al2O3 colloidal suspension and interpreted in terms of the electroneutrality principle. Three titration methods involving a singular reference curve were compared. The first reference used was theoretical, the latter two were representative supernatant curves: an electrolyte solution, and an aliquot of the zero point of titration (ZPT) supernatant. All three methods resulted in similar charge isotherms and a zero point of charge (ZPC) = 8.60. A fourth titration method was developed involving each supernatant of the batch titration sample to act as a unique reference. This latter method is a backtitration technique which accounts for all sources that also consume H+ ions, leaving the difference to be the adsorbed proton concentration only. The NaClO4 electrolyte solution used is postulated to be adsorbed with competitive cation and anion exchange mechanisms with a point of zero salt effect (PZSE) = 7.50.

Carski, T.H. and Sparks, D.L. (1987), Differentiation of soil nitrogen fractions using a kinetic approach. *Soil Science Society of America Journal*, **51** (2), 314-317.

Full Text: [1987\Soi Sci Soc Ame J51, 314.pdf](1987/Soi%20Sci%20Soc%20Ame%20J51,%20314.pdf)

Abstract: The chemically induced release of NH4-N from four Delaware soils was monitored over time. The extractants used were 0.02 M KMnO4-0.5 M H2SO4 at 297 K and 0.01 M CaCl2 at 368 K. Data were analyzed using first-order kinetics. The kinetic approach presented does allow direct differentiation of two NH4+ releasing reactions. Two simultaneous first-order reactions were needed to describe three of the soils, while a single equation described the remaining soil. The equations were considered to represent the release of NH4+ from an inorganic and an organic source. Using this approach, estimates of these pools were made and compared with estimates based on traditional batch techniques. Extraction with acid-KMnO4 yielded kinetic estimates of the inorganic and organic pools, which exceeded the batch estimates of these pools. Kinetic estimates based on extraction with CaCl2 were similar to batch estimates of inorganic N, but much less than either acid-KMnO4 or batch estimates of organic N. Neither extractant gives direct evidence for the existence of a chemically active organic pool, however, there is indirect evidence for such a pool.

Notes: highly cited

Boyd, S.A., Mortland, M.M. and Chiou, C.T. (1988), Sorption characteristics of organic compounds on hexadecyltrimethylammonium-smectite. *Soil Science Society of America Journal*, **52** (3), 652-657.

Full Text: [1988\Soi Sci Soc Ame J52, 652.pdf](1988/Soi%20Sci%20Soc%20Ame%20J52,%20652.pdf)

Abstract: When hexadedyltrimethylammonium (HDTMA) ion is exchanged for metal cations like calcium in smectite, the sorptive properties of the clay are greatly modified. The resultant HDTMA-smectite complex behaves as a dual sorbent, in the sorption of organic compounds, in which the mineral fraction functions as a solid adsorbent and the organic (HDTMA) phase as a partition medium. Capacities of mineral adsorption and partition uptake by HDTMA in the HDTMA-smectites are illustrated by sorption of benzene, trichloroethene (TCE), and water as vapors on the dry sample and by sorption of benzene and TCE from water. The exchanged HDTMA in clay is found to be a much more powerful partition medium than ordinary soil organic matter in the uptake of benzene and TCE. Based on this finding, HDTMA-smectite appears to be an effective sorbent for removing organic contaminants from water. It is suggested that such sorptive organo-clay complexes could be used to enhance the containment capabilities of clay landfill liners and bentonite slurry walls.

Persoff, P. and Thomas, J.F. (1988), Estimating Michaelis-Menten or Langmuir isotherm constants by weighted nonlinear least-squares. *Soil Science Society of America Journal*, **52** (3), 886-889.

Full Text: [1988\Soi Sci Soc Ame J52, 886.pdf](1988/Soi%20Sci%20Soc%20Ame%20J52,%20886.pdf)

Abstract: We derive a nonlinear least squares fitting method for determining either Michaelis-Menten equation or Langmuir adsorption isotherm constants from experimental data. Data points can be weighted unequally if their relative precisions are known. Comparison of this method with the commonly used linearization methods, using simulated data sets containing normally distributed random errors, showed that this method yields more accurate and precise estimates of the constants than any of the linearizations. A short BASIC program to facilitate computation is presented.

Puls, R.W. and Bohn, H.L. (1988), Sorption of cadmium, nickel, and zinc by kaolinite and montmorillonite suspensions. *Soil Science Society of America Journal*, **52** (5), 1289-1292.

Full Text: [1988\Soi Sci Soc Ame J52, 1289.pdf](1988/Soi%20Sci%20Soc%20Ame%20J52,%201289.pdf)

Abstract: Sorption is the predominant process governing metal ion movement in soils and includes the following physical and chemical mechanisms: adsorption, precipitation and absorption. This research attempts to use the hard-soft-acid-base principle to explain sorption selectivity of the metal cations Cd, Ni and Zn by kaolinite and montmorillonite clays. The hard-soft character of the clay surfaces, which is due to their surface functional groups, may be inferred by cation sorption selectivity experiments where pH and complex ion formation are controlled and monitored. Calcium saturated clays were suspended in Ca(ClO4)2, CaCl2 or CaSO4 and spikes of the above metals as divalent cations were added and their reactivity assessed within the framework of the HSAB Principle. For kaolinite in Ca(ClO4)2, metal sorption followed the sequence Cd > Zn > Ni. For montmorillonite in Ca(ClO4)2, metal sorption followed the sequence Cd Zn > Ni. In CaCl2 and CaSO4, the selectivity was different due to the presence of Cl– and SO2–4 which competed with the mineral surfaces for the divalent metal cations.

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Full Text: [1989\Soi Sci Soc Ame J53, 373.pdf](1989/Soi%20Sci%20Soc%20Ame%20J53,%20373.pdf)

Abstract: Solute transport models often use batch-generated adsorption isotherms to partition solute between the aqueous and adsorbed phases, but the relationship at equilibrium between aqueous and adsorbed solute concentrations may be different in closed (batch) and open (flow) systems. Adsorption isotherms were generated for orthophosphate/goethite, silicate/goethite, orthophosphate/soil clay and orthophosphate/arsenated-goethite systems using batch and flow (miscible displacement) techniques. The contact times were 168 and 96 h in the batch and flow experiments, respectively. The shapes of the isotherms generated by the two methods were very similar in all cases, although the flow-generated isotherms were displaced slightly upward relative to the batch isotherms. Simple Langmuir plots of both batch and flow data were nonlinear for all systems, while in all systems containing phosphate, flow-generated distribution coefficients were greater than the corresponding batch-generated values, particularly at low surface coverage. In addition, adsorption maxima and values of the two-surface Langmuir parameter b1 were consistently greater in the flow systems. The results indicate that provided transport processes do not keep the flow system far from chemical equilibrium, batch-generated anion adsorption isotherms are likely to underestimate the extent of adsorption in the corresponding flow system, particularly at relatively low aqueous phase sorbate concentrations. This appears to be due, in part, to the removal of competitive antecedent species in the flow system effluent. It is suggested that flow systems are thermodynamically equivalent to batch systems having very wide solid/solution ratios.

Keywords: Adsorption, Flow of Water-Chemical Reactions, Clay Minerals-Solutions, Phosphates, Silicates, Anion Adsorption Isotherms

Notes: highly cited

? Jardine, P.M., Weber, N.L. and McCarthy, J.F. (1989), Mechanisms of dissolved organic-carbon adsorption on soil. *Soil Science Society of America Journal*, **53** (5), 1378-1385.

Full Text: 1989\Soi Sci Soc Ame J53, 1378.pdf

Abstract: The subsurface transport of inorganic and organic contaminants may be strongly related to the movement of dissolved organic carbon (DOC) through a soil profile. A variety of soil chemical and hydrologic factors control the mobility of the DOC, which may enhance or impede the transport of the associated contaminants. In this study, the sources of DOC adsorption on two proposed waste-site soils are defined, and the chemical mechanisms operative during the adsorption process are specified. Adsorption isotherms for the two soils determined at constant pH, ionic strength (I), and temperature indicated that DOC adsorption increased with increasing soil profile depth. Different adsorption capacities were exhibited by the two soils, however, which was related to their contrasting indigenous organic matter contents and mineralogies. The adsorption of DOC by the soils was not a function of solution I (I = 0.001 to 0.1 mol L−1 using NaCl); however, DOC adsorption was dependent on solution pH, with maximum adsorption occurring at ≃4.5. Competitive ion-exchange studies using Na2SO4 as an ionic-strength adjuster suggested that a portion of the DOC was electrostatically bound to the soil via anion exchange. By using thermodynamic principles, the predominant mechanism of DOC retention by the soil was found to be physical adsorption driven by favorable entropy changes. This is supported by preferential adsorption of the hydrophobic organic solutes to the soil relative to the hydrophilic organic solutes.

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Full Text: [1990\Soi Sci Soc Ame J54, 941.pdf](1990/Soi%20Sci%20Soc%20Ame%20J54,%20941.pdf)

Keywords: Langmuir.

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Full Text: [1990\Soi Sci Soc Ame J54, 942.pdf](1990/Soi%20Sci%20Soc%20Ame%20J54,%20942.pdf)

Keywords: Langmuir

Notes: highly cited

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Full Text: [1991\Soi Sci Soc Ame J55, 43.pdf](1991/Soi%20Sci%20Soc%20Ame%20J55,%2043.pdf)

Abstract: In order to relate mineralogy to sorbent efficiency, organo-clays were prepared from reference vermiculite, illite, smectite, and kaolinite clay minerals using the organic cation hexadecyltrimethylammonium (HDTMA). Adsorption isotherms using C-14-HDTMA indicated stoichiometric adsorption of HDTMA up to the cation-exchange capacity (CEC). Organo-clays were prepared by adding HDTMA equivalent to the CEC and were evaluated as sorbents for nonionic organic compounds (NOCs) dissolved in water. X-ray diffraction analysis of the HDTMA clays revealed basal spacings of 28 angstrom for the vermiculite and 23, 20, and 18 angstrom for the high-charge, intermediate-charge, and low-charge smectites, respectively. The HDTMA vermiculite, illite, and smectites were all highly effective sorbents for NOCs, whereas Mg smectite was ineffective. The sorption isotherms of benzene, toluene, ethylbenzene, propylbenzene, butylbenzene, t-butylbenzene, naphthalene, and biphenyl on the HDTMA clays indicated that sorption occurred by partition interactions with the HDTMA-derived organic phase. In general, both the greater HDTMA content and the larger basal spacings of high-charge HDTMA clays increased NOC sorption. Mineral-charge effects on the sorption of unsubstituted aromatic compounds (benzene, naphthalene, and biphenyl) were less evident than for alkyl-benzenes. Greater sorption of the alkylbenzenes by high-charge HDTMA clays can be attributed to the capability of the large basal spacings to accommodate larger solute molecules. The formation of organic cation exchanged soil clays derived from vermiculite, illite, or smectite may greatly improve the ability of soils to immobilize organic contaminants.

Keywords: Adsorption, Benzene, Cation Exchange, Isotherms, Layer Charge, Naphthalene, Reduction, Retention, Smectites, Sorption, Water

Notes: highly cited

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Full Text: 1991\Soi Sci Soc Ame J55, 1112.pdf

Abstract: Dissolved organic matter (DOM) is a major vehicle for the translocation and loss of N and P from forest ecosystems. The chemical properties of DOM and its interactions with soil surfaces are crucial in determining the mobility of these organic nutrients. We fractionated DOM from throughfall, all soil horizons (Ultisols and Inceptisols), and stream water from an Appalachian mountain forest ecosystem into hydrophobic or hydrophilic acids, neutrals, and bases. We analyzed each fraction for dissolved organic C (DOC), N (DON), and P (DOP). Most of the DOC was in the acid fractions, with the humic fractions (hydrophobic acids and phenols) comprising 35 to 57% of the DOC in all samples except summer throughfall. Concentrations of all fractions declined with depth in the soil. As a percent of total DOC, the humics declined with depth, whereas the hydrophilic neutrals increased. Bases, which we expected to contain cationic amino groups, were < 2.5% of the DOC. Instead, most DON was in the humic, hydrophilic acid, and hydrophilic neutral fractions. Most DOP occurred in the hydrophilic acid, humic, and hydrophilic neutral fractions. The functional groups in which N and P occur had little influence on the behavior of most of the DOM as a whole since: (i) cationic DOM was such a minor component, and (ii) P was simply too rare to influence the anionic behavior of many molecules. Nevertheless, for those molecules in which P did occur, P may have influenced their behavior since a large percentage of the DOP was in the hydrophilic acid (i.e., anionic) fraction. The carboxylic and phenolic functional groups, or in some cases the neutrality, of the DOM molecules appeared to be much more important than N-containing groups in influencing the behavior of the N carried passively by the DOM.

Keywords: Humic Substances, Acid Treatment, Amino-Acids, River Water, Carbon, Adsorption, Chemistry, Retention, Solutes, Growth

? Aharoni, C., Sparks, D.L., Levinson, S. and Ravina, I. (1991), Kinetics of soil chemical reactions: Relationships between empirical equations and diffusion models. *Soil Science Society of America Journal*, **55** (5), 1307-1312.

Full Text: [1991\Soi Sci Soc Ame J55, 1307.pdf](1991/Soi%20Sci%20Soc%20Ame%20J55,%201307.pdf)

Abstract: A variety of kinetic equations such as zero-order, first-order, second-order, Elovich, fractional-power, and parabolic-diffusion equations have been used to describe the kinetics of soil chemical processes. Often, several of these expressions seem to equally well describe the kinetics of a particular reaction. In this research, it is shown that the kinetics of phosphate sorption, release can be described by an expression that is approximated at beginning times by a fractional-power equation, at intermediate times by the Elovich equation, and at long times by an apparent first-order equation. Such kinetics, which can be characterized by a sigmoidal zeta(t) plot of the reciprocal of the rate against the time [(dq, dt)-1 vs. t], are consistent with theoretical homogeneous and heterogeneous models based on diffusion of the sorbate in the solid phase or at the solid, liquid interface. These models were applied to data from the published literature on sorption and release of phosphates by soils. For some soils, the experimental results were accounted for by assuming a constant diffusion coefficient. For other soils, it was assumed that diffusion processes with various diffusion coefficients take place simultaneously. Using these models, diffusion parameters can be estimated.

Keywords: Desorption, Dissolution, Elovich Equation, Microporosity, Occlusion, Oxides, Phosphate Sorption, Release, Time

Stevenson, F.J. and Chen, Y. (1991), Stability-constants of copper(II) humate complexes determinedby modified potentiometric titration. *Soil Science Society of America Journal*, **55** (6), 1586-1591.

Full Text: [1991\Soi Sci Soc Ame J55, 1586.pdf](1991/Soi%20Sci%20Soc%20Ame%20J55,%201586.pdf)

Abstract: Humic substances form highly stable complexes with micronutrient cations. Little isknown, however, regarding the nature of the complexes or of their stabilityconstants. A ligand titration procedure using the Cu(II) ion-selective electrode wasinvestigated as a means of determining stability constants of the Cu(II) complexeswith humic and fulvic acids. The procedure was superior to conventional titration(metal ion as titrant) because constants for binding at the strongest sites aremeasured. Furthermore, under the titration conditions employed (pH of 4 and 5, lowionic strength, 0.01 M, low Cu(II) concentration, 10-5 M), precipitation did not occurand thus did not adversely affect the binding measurements. Acontinuous-distribution model showed promise for modeling the binding data. Thebinding affinity of some humates for Cu(II) followed the order: soil humic acid (SHA)> peat humic acid (PHA) > lignite humic acid (LHA) > soil fulvic acid (SFA) fungalmelanin. Intrinsic stability constants (log K (bnl)) at pH 4 and an ionic strength of .01M for the five humate preparations were 8.3, 7.9, 7.4, 7.2, and 6.9, respectively, constants at pH 5 were 8.5, 8.4, 7.9, 7.6, and 7.6, respectively.

Keywords: Fulvic-Acid, Organic-Matter, Humic-Acid, Soil, Fractions

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Full Text: [1991\Soi Sci Soc Ame J55, 1592.pdf](1991/Soi%20Sci%20Soc%20Ame%20J55,%201592.pdf)

Abstract: Better information is needed to predict how soil acidity affects exchangeability of heavy metals in soils dominated by Fe and Mn oxides with pH-dependent charge. Our laboratory study sought to separate exchangeable and nonexchangeable Zn sorbed by four B horizon soil materials with varied mineralogy and sesquioxide contents. A Myersville silt loam (fine-loamy, mixed, mesic Ultic Hapludalf), a Jackland sandy loam (fine, mixed, mesic Aquic Hapludalf), a Christiana sandy loam (clayey, kaolinitic, mesic Typic Paleudult), and an Evesboro loamy sand (mesic, coated Typic Quartzipsamment) were compared for the exchangeability of Zn as a function of pH. Surface charge was measured across the pH range of 3.5 to 7.6, a 175 µmol ZnCl2/kg soil treatment was applied, and sorbed Zn was exchanged with K. Cation-exchange capacity (CEC) was positively correlated with nonexchangeable but not with exchangeable Zn forms. All four soils retained nearly the same amount of Zn, even though CEC ranged from < 10 to > 80 mmol5/kg. An abrupt transition from exchangeable to nonexchangeable Zn occurred in the pH range 5.6 to 5.9 of the Myersville, Evesboro, and Christiana soils. Differences in oxide mineralogy and proton buffering intensity appeared more important than CEC as controls on the exchangeability of Zn in these soils. This result is germane to predicting retention of heavy metals in sewage-sludge-amended agricultural soils.

Keywords: Heavy-Metals, Adsorption, Solubility, Oxides, Mechanisms, Copper, Lead, Iron, Acid

Niemeyer, J., Chen, Y. and Bollag, J.M. (1992), Characterization of humic acids, composts, and peat by diffuse reflectance fourier-transform infrared-spectroscopy. *Soil Science Society of America Journal*, **56** (1), 135-140.

Full Text: [1992\Soi Sci Soc Ame J56, 135.pdf](1992/Soi%20Sci%20Soc%20Ame%20J56,%20135.pdf)

Abstract: Transmission infrared (IR) spectroscopy, either dispersive or Fourier transformed (FTIR), has been used extensively in studies on humic substances. A variety of bands characteristic of molecular structures and functional groups have been identified for these substances. The development of an attachment mounted onto FTIR spectrophotometers has allowed the determination of diffuse reflectance Fourier-transformed infrared (DRIFT) spectra. The purpose of this work was to study the applicability of DRIFT to soil organic-matter research and to compare the use of this instrumentation to dispersive and Fourier-transformed transmission IR spectroscopy. The DRIFT spectra were determined for humic acids, peat samples, and composts. In addition, the possibility of using DRIFT spectra to quantitatively measure sample concentration and measuring the relative concentration of functional groups was assessed. Sample preparation for DRIFT is much simpler than for transmission IR spectroscopy, interferences due to water adsorption are reduced, and resolution is improved. The spectra obtained using DRIFT had a higher degree of resolution as compared with dispersive and Fourier-transform transmission IR spectroscopy. Bands indicative of aliphatic C-H, carboxyl and corboxylate functional groups, aromatic C = C, and C-O stretch of polysaccharides were prominent and very well resolved. The DRIFT spectra obtained can also be used to fingerprint organic matter acquired from various sources. Spectra obtained at various concentrations of humic acid indicated that DRIFT cannot be used to estimate concentrations of organic matter in a given mixture. Relative concentrations of functional groups, however, were found to be fairly constant regardless of sample concentration. Therefore, changes in the relative concentration of functional groups can be measured during the humification process. It is expected that the application of DRIFT to organic-matter research will prove especially useful for characterizing bulky heterogeneous samples such as peat and composts.

Keywords: Spectra

Notes: highly cited

? Qualls, R.G. and Haines, B.L. (1992), Biodegradability of dissolved organic matter in forest throughfall, soil solution, and stream water. *Soil Science Society of America Journal*, **56** (2), 578-586.

Full Text: [1992\Soi Sci Soc Ame J56, 578.pdf](1992/Soi%20Sci%20Soc%20Ame%20J56,%20578.pdf)

Abstract: High concentrations of dissolved organic matter (DOM) were leached into rainwater passing through the canopy and forest floor of an oak (Quercus spp.)-hickory (Carya spp.) forest in the southern Appalachian Mountains. More than 95% of this dissolved organic C (DOC) and N (DON) was removed as water percolated through the soil profile and left the ecosystem in stream water. Our objective was to examine the importance of decomposition in the removal of DOC and DON. Samples of DOM from throughfall, forest floow water, soil water from A and B soil horizons, and stream water were all adjusted to a common initial DOC concentration, inoculated with soil and stream microbes, and incubated in solution for 134 d. In general, only 14 to 33% of the DOC in forest floor, soil solution, and stream samples decomposed during the incubation. The relative order of average decomposition of DOC from the various strata was, from fastest to slowest: throughfall, Oi horizon (forest floor), Oa horizon (forest floor), B horizon, stream, AB horizon, isolated fulvic acid, and upper A horizon. In short, biodegradability of DOM in the ecosystem profile declined vertically from throughfall to the A horizon and then increased with depth. The DON generally did not decay faster than the DOC - results consistent with the idea that hydrolysis of organic N is linked to mineralization of DOC rather than occurring selectively in response to the biochemical need for N. Throughfall DOM could be decomposed during its passage through the upper soil, but decomposition seems too slow to be responsible for the bulk of removal of DON and DOC that occurs in the mineral soil. Adsorption, rather than biodegradation, is more likely responsible for maintaining low DOC substrate concentrations in the mineral soil and preventing its loss into stream water.

Keywords: Leaf Leachate, Carbon, Decomposition, Mechanisms, Kinetics, Leaves, River

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Full Text: [1993\Soi Sci Soc Ame J57, 57.pdf](1993/Soi%20Sci%20Soc%20Ame%20J57,%2057.pdf)

Abstract: Many important reactions involving colloidal suspensions are rapid. Here, we introduce the application of a technique capable of rapidly measuring a reactant species (within 20 ms after the reaction initiation) in situ: an electron paramagnetic resonance spectroscopically monitored stopped-flow method (EPR-SF). The utility of this technique is demonstrated by investigating the sorption of Mn2+ on delta-MnO2. The sorption reaction was complete in <1 s, with >80% of the Mn2+ being sorbed within 200 ms. A first-order rate dependence on Mn2+ was observed. Measurement of the initial reaction rate allowed the forward (sorption) rate constant to be determined (k(f) = 3.74×10-3 s-1), and the reverse (desorption) rate constant was determined using an integrated reversible first-order rate expression (k(r) = 3.08×10-4 s-1). Using these rate constants, the predicted time dependence of Mn2+ sorption was in good agreement with the measured sorption rate. The results indicate that chemical kinetics are being measured that allow determination of precise reaction rates and mechanisms.

Keywords: Solid-Solution Interface, Aqueous Suspensions, Spin-Resonance, Adsorption, Ion, (Hydr)Oxides, Spectroscopy, Chemistry, Oxidation, Exchange

? Jardine, P.M., Jacobs, G.K. and Wilson, G.V. (1993), Unsaturated transport processes in undisturbed heterogeneous porous media: I. Inorganic contaminants. *Soil Science Society of America Journal*, **57** (4), 945-953.

Full Text: [1993\Soi Sci Soc Ame J57, 945.pdf](1993/Soi%20Sci%20Soc%20Ame%20J57,%20945.pdf)

Abstract: Prolonged disposal of organic and inorganic waste in shallow land burial sites throughout the USA has prompted detailed investigations of subsurface contaminant transport processes. The fate and transport of contaminant leakage from pits, trenches, and cribs into the vadose zone via storm events is not well understood. The objective of this study was to investigate the thermodynamic and kinetic processes controlling the transport of inorganic contaminants in unsaturated, heterogeneous subsurface media. Large undisturbed columns were isolated from a proposed waste site consisting of fractured saprolite (weathered interbedded shale and limestone), and steady-state nonreactive and reactive solute transport experiments were performed at a variety of pressure heads. Observed breakthrough curves (BTC) for binary and ternary mixtures in the Co-Sr-Ca system were delayed relative to nonreactive Br BTC, indicating that the former tracers were adsorbed by the solid phase. Transport of the binary mixtures Co-Ca and Sr-Ca was predicted reasonably well with the equilibrium convective-dispersive (CD) equation using independent measurements of all model parameters. However, application of the nonequilibrium or kinetic CD model to the observed Sr and Co binary data resulted in an improved description of contaminant transport. Cation-exchange equilibria relationships on homogenized subsurface material, using both shake batch and miscible displacement methods, adequately described the thermodynamic processes that were prevalent during contaminant transport. These results suggest that preferential transport of reactive contaminants is negligible for the unsaturated conditions used in this study, and that the structured saprolite within the subsurface media is a chemically active constituent during reactive solute transport. Although the transport of contaminants in the ternary Co-Sr-Ca system tem exhibited many of the same features as the binary transport studies, an attempt to simulate the transport of contaminants in the ternary system as independent species was less than adequate.

Keywords: Controlling Subsurface Transport, 2 Contrasting Watersheds, Solute Transport, Storm Events, Forested Watersheds, Upper Subcatchment, Soil, Macroporosity, Adsorption, Columns

Hinz, C. and Selim, H.M. (1994), Transport of zinc and cadmium in soils: Experimental evidence and modeling approaches. *Soil Science Society of America Journal*, **58** (5), 1316-1327.

Full Text: [1994\Soi Sci Soc Ame J58, 1316.pdf](1994/Soi%20Sci%20Soc%20Ame%20J58,%201316.pdf)

Abstract: This study was conducted to assess the suitability of several isotherm equations in describing single solute and binary ion exchange of Zn and Cd in two soils (Windsor and Olivier). Isotherms were determined using batch methods for equilibration times of 1 and 14 d. Ion exchange batch experiments (based on NH4OAc extraction) were carried out at different heavy metal/Ca ratios. Several isotherm equations were capable of describing 1- and 14-d sorption isotherms. However, the general Langmuir-Freundlich was most suitable for describing single solute (Zn and Cd) isotherms, whereas the Rothmund-Kornfeld ion exchange equation well described binary data sets (Zn-Ca and Cd-Ca). Miscible displacement experiments were carried out to study Zn and Cd transport in uniformly packed soil columns (10 cm in length) for different how velocities. For Windsor soil, the general isotherm equation predicted Zn transport results adequately but not Cd results. Moreover, under conditions of variable ionic strength, the use of constant selectivity (equal affinity) for ion exchange provided consistently superior predictions of Zn and Cd transport than the Rothmund-Kornfeld (variable affinity) approach. Attempts to predict Cd and Zn transport in Olivier soil, using several isotherms and ion exchange approaches, were not successful. Local equilibrium appeared dominant for Windsor soil, whereas nonequilibrium sorption behavior may be rate limiting for Zn and Cd transport in Olivier soil.

Keywords: Ion-Exchange, Adsorption-Isotherms, Retention, Equation, Cations, Columns, Batch

? Schmidhalter, U., Kahr, G., Evequoz, M., Studer, C. and Oertli, J.J. (1994), Adsorption of thiamin (Vitamin-B-1) on soils and clays. *Soil Science Society of America Journal*, **58** (6), 1829-1837.

Full Text: [1994\Soi Sci Soc Ame J58, 1829.pdf](1994/Soi%20Sci%20Soc%20Ame%20J58,%201829.pdf)

Abstract: Recent research suggests that thiamin applied to soils or coated onto seeds may stimulate plant growth. The behavior of thiamin in soils has not been investigated. Therefore, studies were carried out to determine how thiamin hydrochloride (3-[(4-amino-2-methylpyrimidinyl)methyl]-5-(2-hydroxyethyl)-4-methylthia zolium chloride hydrochloride) is adsorbed by 17 soils and three clays. The dominate mechanism in binding of thiamin is thought to be cation exchange with clay minerals and organic matter. In soils with low to medium organic matter content, thiamin adsorption occurred primarily on clay minerals and depended particularly on the amount and composition of the clay. Adsorption is species dependent (pK(a1) [negative logarithm of the first dissociation constant] = 4.85) and takes place principally in the acidic pH range, probably with position 1’ of the pyrimidine ring. Adsorption equilibrium is attained in <30 min. Adsorption in all soils, and in kaolinite and illite clays, could be described by a one-surface Langmuir isotherm at initial concentrations ranging from 16.3 to 995 mu mol L-1. Adsorption by smectite in the same range was log-linearly related to the equilibrium concentration. Extending the initial concentration range from 16.3 to 9890 mu mol L-1 showed that a two-surface Langmuir equation more adequately described adsorption in hydroxy-interlayered vermiculitic and chloritic-illitic soils, whereas a one-surface Langmuir equation was found to be adequate in mixed layer-smectitic soils. Only in the case of smectite clays is thiamin allowed to lie in a monolayer configuration parallel to the basal plane.

Keywords: Clay, Organic Matter, Two-Surface Langmuir

Allen, E.R., Ming, D.W., Hossner, L.R. and Henninger, D.L. (1995), Modeling transport kinetics in clinoptilolite-phosphate rock systems. *Soil Science Society of America Journal*, **59**, 248-255.

Full Text: [1995\Soi Sci Soc Ame J59, 248.pdf](1995/Soi%20Sci%20Soc%20Ame%20J59,%20248.pdf)

Abstract: Nutrient release in clinoptilolite-phosphate rock (Cp-PR) systems occurs through dissolution and cation-exchange reactions. Investigating the kinetics of these reactions expands our understanding of nutrient release processes. Research was conducted to model transport kinetics of nutrient release in Cp-PR systems, The objectives were to identify empirical models that best describe NH4, K and P release and define diffusion-controlling processes. Materials included a Texas clinoptilolite (Cp) and North Carolina phosphate rock (PR), A continuous-flow thin-disk technique was used, Models evaluated included zero order, first order, second order, parabolic diffusion, simplified Elovich, Elovich and power function, The power-function, Elovich and parabolic-diffusion models adequately described NH4, K and P release, The power-function model was preferred because of its simplicity. Models indicated nutrient release was diffusion controlled. Primary transport processes controlling nutrient release for the time span observed were probably the result of a combination of several interacting transport mechanisms.

? Hayes, K.F., Chen, C.C. and Mcavoy, D.C. (1995), Quaternary ammonium surfactant effects on sorption of trace-metals onto quartz and aluminosilicates. *Soil Science Society of America Journal*, **59** (2), 380-387.

Full Text: [1995\Soi Sci Soc Ame J59, 380.pdf](1995/Soi%20Sci%20Soc%20Ame%20J59,%20380.pdf)

Abstract: This study was conducted to investigate the potential impact of quaternary ammonium compounds (QACs) on trace metal ion desorption from soil constituents. Three soil constituents (quartz, kaolinite, and montmorillonite), two trace metal cations [Co(II) and Sr(II)], and three alkyltrimethylammoniumchloride surfactants (C8TMAC, C12TMAC, and C16TMAC) were chosen for this investigation. For the quartz system, Co(II) showed no desorption while Sr(II) showed a slight pH-dependent desorption. For kaolinite or montmorillonite systems, desorption of Co(II) and Sr(II) by QACs occurred only for the fraction of the trace metal cations sorbed on permanent-charge sites. In the case of montmorillonite, Sr(II) was significantly desorbed at all pH values. This was thought to be a result of the nearly exclusive sorption of Sr(II) to the permanent-charge sites in this system. In all other clay systems studied [Sr(II), Co(II) on kaolinite, Co(II) on montmorillonite], desorption only occurred at lower pH from permanent-charge sites. No desorption occurred at higher pH values where sorption to surface hydroxyl sites was indicated. In general, QAC-induced desorption of trace metal cations was found to be significant only when QAC sorption equaled or exceeded the cation-exchange capacity. Surfactant chain length was found to have little effect on the overall pH-dependent desorption trends. As expected, higher surfactant concentration was required to cause trace metal ion desorption as the surfactant chain length decreased.

Keywords: X-Ray Absorption, Water Interface, Organic Cations, Adsorption, Complexes, Ions, Charge, Clays, Model

Olila, O.G. and Reddy, K.R. (1995), Influence of pH on phosphorus retention in oxidized lake sediments. *Soil Science Society of America Journal*, **59**, 946-959.

Full Text: [1995\Soi Sci Soc Ame J59, 946.pdf](1995/Soi%20Sci%20Soc%20Ame%20J59,%20946.pdf)

Abstract: Diel pH changes in lake waters resulting from high photosynthetic activity may regulate water-soluble P concentration (WSP) and P sorption by suspended sediments in shallow eutrophic lakes. Laboratory studies were conducted to determine the pH effect on P fractions and P sorption kinetics in oxidized sediment suspensions from two subtropical lakes (Lake Apopka and Lake Okeechobee, Florida). The P sorption rate was calculated for sediment suspensions adjusted to various pH levels: 6.5, 7.0, 8.5, 9.5 and 10.5 for Lake Apopka and 6.5, 7.0, 8.5, 9.5 and 10.5 for Lake Okeechobee. A decrease in pH increased the WSP concentrations in Lake Apopka sediment suspensions hut had no effect on WSP concentrations in Lake Okeechobee sediment suspensions. Lake Apopka sediment suspensions at pH 7.0 (ambient) and below did not show net P uptake. Phosphorus uptake for Lake Apopka occurred only when pH was increased to greater than or equal to 8.5 and when P treatments were increased to greater than or equal to 27 mmol P kg-1, which resulted in supersaturation with respect to octacalcium phosphate. Phosphate solubility diagrams and mineral equilibria calculations suggest that P uptake by Lake Apopka sediment suspensions at pH greater than or equal to 8.5 was due to P coprecipitation with CaCO3 and probable formation of nonapatitic Ca-P compounds. Phosphorus sorption on Lake Okeechobee sediment suspensions followed first-order kinetics for all pH levels studied, with rate constants (k) ranging from 0.003 to 0.75 h-1. High P uptake by Lake Okeechobee sediment suspensions could be attributed to two reactive components: (i) amorphous or poorly crystalline Fe and Al oxyhydroxides at pH < 7.5 and (II) Ca/Mg carbonates and other minerals at pH greater than or equal to 7.5.

Schulthess, C.P. and Tokunaga, S. (1996), Metal and pH effects on adsorption of poly (vinyl alcohol) by silicon oxide. *Soil Science Society of America Journal*, **60** (1), 92-98.

Full Text: [1996\Soi Sci Soc Ame J60, 92.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%2092.pdf)

Abstract: The adsorption of pentanol onto a smectite shows an adsorption edge at pH 10. Because adsorption similarities between smectites and Si oxides have been noted in the literature, we anticipated that poly (vinyl alcohol) (PVA) would also display an adsorption edge near pH 10 on a Si oxide (SiO2). Adsorption edges between pH 9 and 10 on Si oxide were confirmed when using two PVA polymers of 98 and 88% hydrolysis (MW = 11000 and 10000 g mol-1, respectively). The decrease in adsorption at high pH is attributed to the interference of Na+ adsorption on the Si oxide. The addition of aqueous metals (Al3+, Pb2+, Cu2+, Mg2+, and Ba2+) significantly modified the adsorption envelope of PVA on the Si oxide in various ways. Three mechanisms are proposed: metals may modify the Si surface, interact with the PVA while in the aqueous phase, or form an additional independent surface that can adsorb the PVA polymer. New PVA adsorption envelopes were observed at high pH in the presence of Mg, Cu, and (adsorbed) Pb. The presence of metals also increased the amount of PVA (98% hydrolysis) adsorbed at low pH, but caused no change in, or decreased, the amount of PVA (88% hydrolysis) adsorbed on a mass per area basis. Because of this, we suggest that the metals can modify the effective thickness of the polymers on the surface. The adsorption of Pb and Al on the Si oxide modified the solubility of Si, suggesting a chemisorption reaction with the surface.

Salim, I.A., Miller, C.J. and Howard, J.L. (1996), Sorption isotherm-sequential extraction analysis of heavy metal retention in landfill liners. *Soil Science Society of America Journal*, **60** (1), 107-114.

Full Text: [1996\Soi Sci Soc Ame J60, 107.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%20107.pdf)

Abstract: The chemical partitioning of heavy metals in soil materials is of great importance in risk assessment, landfill bottom liner design, and remedial investigation. The sorption characteristics of clayey calcareous sediments used to construct landfill bottom liners at four sites in southeastern Michigan were studied using a new method: combined sequential extraction-sorption isotherm analysis (CSSA). After spiking to simulate high levels of contamination, the sediments sorbed large quantities of Pb (similar to 1480-145 000 mg kg-1), Ni (similar to 750-8100 mg kg-1), and Cd (similar to 980-5070 mg kg-1). Sequential extraction data indicated that Pb and Ni were principally in a carbonate-occluded form, whereas Cd was mainly in an exchangeable form at high levels (>1000 mg kg-1) of contamination. These results suggest that Pb and Ni will be immobilized by the Liner materials but Cd will probably be highly mobile. By applying sequential extraction analysis after spiking, Langmuir sorption isotherms were constructed successfully for most of the individually targeted phases. Thus, CSSA appears to be a promising method for predicting the attenuation capabilities of soils and sediments because it allows the sorption capacities of individual phases to be determined while together in a natural system.

Keywords: Roadside Soils, United-States, Sewage-Sludge, Trace Amounts, Adsorption, Lead, Cadmium, Copper, Sediments, Zinc

Notes: highly cited

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Full Text: [1996\Soi Sci Soc Ame J60, 121.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%20121.pdf)

Abstract: The mobility of As in soils depends on several factors including redox potential, soil mineralogy, pH, and the presence of other oxyanions that compete with As for soil retention sites. We investigated the effects of pH and competing anions on the adsorption of arsenate [As(V)] on α-FeOOH (goethite) and γ-Al(OH)3 (gibbsite). Batch equilibrium As(V) adsorption experiments were conducted with P and Mo as competing anions in order to produce single-anion [As(V), P, and Mo] and binary-anion [As(V)/P and As(V)/Mo] adsorption envelopes (adsorption vs. solution pH). Arsenate and P single-anion adsorption envelopes were similar with substantial adsorption occurring across a wide pH range, including pH values above the points of zero charge of the oxides. Maximum Mo adsorption occurred across a narrower pH range (pH 4-6). On both oxides, equimolar P concentrations decreased As(V) adsorption within the pH range 2 to 11, whereas Mo decreased As(V) adsorption only below pH 6. The constant capacitance model was used to predict competitive surface complexation behavior between As(V)/P and As(V)/Mo using intrinsic equilibrium constants [K-anion (int)] optimized from single-anion data. In addition, the model was applied using one-site (monodentate) and two-site (monodentate + bidentate) conceptualizations of the oxide surface. The two approaches gave comparable fits to experimental adsorption data and were consistent with competitive adsorption observed in binary adsorption envelopes.

Keywords: Adsorption, Anions, Arsenate, Competitive Adsorption, Equilibrium, Exchange, Ferrihydrite, Gibbsite, Goethite α-FeOOH, Kinetics, Soils, Solution Interface, Sorption, Surface-Chemistry

? Schulthess, C.P. and Dey, D.K. (1996), Estimation of Langmuir constants using linear and nonlinear least squares regression analyses. *Soil Science Society of America Journal*, **60** (2), 433-442.

Full Text: [1996\Soi Sci Soc Ame J60, 433.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%20433.pdf)

Abstract: A nonlinear least squares (NLLS) regression analysis of the Langmuir equation is described here based on minimizing the sum of the normal distance of the data to the isotherm. This regression can yield different Langmuir constants when compared with linear regression methods and another NLLS method - one based on minimizing the sum of the squares of the vertical distance of the data to the isotherm. The two NLLS regressions can also result in two different conclusions (or suggestions) about the physicochemical characteristics of the adsorption phenomena. There is no fundamental, mathematical requirement that the nonlinear regression be based on a vertical minimum save that it is easier to evaluate. More importantly, the vertical NLLS regression is strongly biased toward fitting the low-concentration data, this is remedied by using the normal NLLS regression. None of the regressions are endorsed per se since they should all agree if the isotherm is Langmuirian. The normal NLLS regression method is not sensitive to the goodness-of-fit criteria and, therefore, is considered to be robust. The criteria for choosing a regression method should consider both its sensitivity to data error plus its sensitivity to nonideality. A deviation in the data is not necessarily due to random measurement errors only (which are often easy to identify when the data are numerous and duplicated), but may also be due to the presence of a partially non-langmuir adsorption phenomenon. In the latter case, the Langmuir constants usually remain useful, but they must be used cautiously.

Keywords: Adsorption

Buchter, B., Hinz, C., Gfeller, M. and Fluhler, H. (1996), Cadmium transport in an unsaturated stony subsoil monolith. *Soil Science Society of America Journal*, **60** (3), 716-721.

Full Text: [1996\Soi Sci Soc Ame J60, 716.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%20716.pdf)

Abstract: Heavy metal mobility in soil can adversely affect our environment. To assess Cd mobility under experimental conditions that can be found in field soils, we investigated Cd transport in an undisturbed stony monolith of a calcareous subsoil. In this context, we evaluated different batch experiments to independently predict Cd transport. Simple (monocomponent) Cd isotherms and binary Ca-Cd cation-exchange isotherms were determined. The method used for determining the ion-exchange isotherm accounted for calcite dissolution. The column experiment was carried out under unsaturated conditions by keeping the lower end at a suction of 2 kPa. A 20 mM Cd pulse was applied during 19 d and the effluent concentration monitored for 91 d. The peak concentration of the effluent exceeded the Cd concentration, as computed with thermodynamic equilibrium models, by three orders of magnitude. During elution, one-third of the Cd remained in the column, indicating sorption hysteresis. Simulations with Freundlich isotherms and selectivity coefficients were capable of describing the sorption front. We modeled the hysteresis with a two-site model that included irreversible sorption so that both sorption and desorption fronts were described equally well.

Keywords: Solute Transport, Saturated Soil, Solid-Solution, Adsorption, Sorption, Model, Calcium, Surface, Simulation, Interface.

Scheidegger, A.M., Fendorf, M. and Sparks, D.L. (1996), Mechanisms of nickel sorption on pyrophyllite: Macroscopic and microscopic approaches. *Soil Science Society of America Journal*, **60** (6), 1763-1772.

Full Text: [1996\Soi Sci Soc Ame J60, 1763.pdf](1996/Soi%20Sci%20Soc%20Ame%20J60,%201763.pdf)

Abstract: Retention of heavy metal ions on soil mineral surfaces is a crucial process for maintaining environmental quality. A thorough understanding of the sorption mechanisms of heavy metals on soil mineral surfaces is therefore of fundamental importance. This study examined Ni(II) sorption mechanisms on pyrophyllite. The removal of Ni from solution was studied as a function of pH (pH = 5-8.5), initial Ni concentration (1×10-4 to 1×10-2 M) and ionic strength (0.01-1 M). The data suggest that Ni sorption behavior can be divided into two distinct pH regions. In the lower pH region (i.e., pH < 7), relative Ni sorption increased with decreasing ionic strength and initial Ni concentration. The adsorption maximum at pH = 6 was significantly higher than the cation-exchange capacity (CEC) at the same pH. Based on these findings, we propose that both specific and nonspecific adsorption are involved. In the higher pH region (pH > 7), nickel sorption becomes slow and does not seem to be affected by the ionic strength and the initial Ni concentration. We employed high-resolution transmission electron microscopy (HRTEM) to ascertain whether any alteration in the surface structure of pyrophyllite could be detected after reaction with Ni at pH >7. Surface deposits, not present on untreated samples, were found. At low Ni sorption densities, surface precipitation seems to occur preferentially along the edges of the particles. Based on the HRTEM findings and on results from a previous x-ray absorption fine structure spectroscopy (XAFS) study, we hypothesize that the formation of a mixed Ni-Al hydroxide phase on the pyrophyllite surface is responsible for the sorption behavior above pH 7.

Keywords: Ray-Absorption Spectroscopy, Chromium(III) Sorption, Surface Precipitation, Adsorption-Desorption, Reaction-Kinetics, Cadmium Sorption, Boron Adsorption, Oxide Surfaces, Clay-Minerals, Kaolinite

? Shen, S.Y., Tu, S.I. and Kemper, W.D. (1997), Equilibrium and kinetic study of ammonium adsorption and fixation in sodium-treated vermiculite. *Soil Science Society of America Journal*, **61** (6), 1611-1618.

Full Text: [1997\Soi Sci Soc Ame J61, 1611.pdf](1997/Soi%20Sci%20Soc%20Ame%20J61,%201611.pdf)

Abstract: Ammonium fixation in vermiculite affects the movement of N in many soils. The effects of particle size, solution concentration, pH, and associated anions on NH4+ fixation in vermiculite are also important information for reducing N leaching from soils. In this study, the retention of NH4+ on the exchangeable and nonexchangeable sites of Montana vermiculite was determined in batch experiments. In the NH4+-K+ exchange isotherm, the exchangeable sites of the vermiculite exhibited a preference for K+ to NH4+, while the nonexchangeable sites preferred NH4+ to K+. The nonexchangeable sites of the sand fraction had a higher preference for NH4+ at lower solution NH4+ concentration and a lower preference at higher NH4+ concentration. An opposite case was observed for the NH4+ concentration effect on the preference of nonexchangeable sites in the clay fraction. The retention isotherm of total NH4+ in the vermiculite exhibited S-shape curves that can be described by the “two-surface” Langmuir-Freundlich equation. In the kinetic study, the clay fraction adsorbed the largest amount of exchangeable NH4+, but the silt fraction fixed the most NH4+ on its nonexchangeable sites. The retention of NH4+ in vermiculite increased with solution NH4+ concentration. Ammonium adsorption on the exchangeable sites increased at low solution pH, while NH4+ fixation was unaffected by pH change. The effect of associated anions was insignificant, except they caused a pH difference in solution.

Keywords: Clay, Equation, Model, Nitrogen, Soils

? Kithome, M., Paul, J.W., Lavkulich, L.M. and Bomke, A.A. (1998), Kinetics of ammonium adsorption and desorption by the natural zeolite clinoptilolite. *Soil Science Society of America Journal*, **62** (3), 622-629.

Full Text: [1998\Soi Sci Soc Ame J62, 622.pdf](1998/Soi%20Sci%20Soc%20Ame%20J62,%20622.pdf)

Abstract: The kinetics of NH4+ adsorption and desorption were investigated on the natural zeolite clinoptilolite to ascertain its ability to adsorb and release the important plant nutrient N in its NH4+ form at various pH values and initial NH4+ concentrations. Kinetics of NH4+ adsorption were evaluated on the samples using solutions containing 140.1, 280.2, 560.4, and 840.6 mg L-1 of NH4+-N at pH 4, 5, 6, and 7, equilibrated for 5, 10, 15, 20, 30, 45, 60, 75, 90, and 120 min. Samples for NH4+ desorption were equilibrated with 70.1, 280.2, 560.4, and 1401 mg L-1 NH4+-N solution at pH 4, 5, 6, and 7 for 2.5 h, and adsorbed NH4+ extracted with 2 M KCI for 5, 10, 20, 30, 45, 60, 90, 120, 150, 180, and 300 min. Equilibrium time for NH4+ adsorption ranged from 60 min for 140.1 mg L-1 initial NH4+-N concentration at pH 4 to 120 min for 840.6 mg L-1 initial NH4+-N concentration at pH 7. Desorption was nearly complete in 150 min for low initial NH4+ concentrations and 200 min for high initial NH4+ concentrations. Amounts of NH4+ sorbed increased with increasing pH and initial NH4+ concentrations. Models evaluated included the first-order kinetics, modified Freundlich, parabolic diffusion, Elovich, and heterogeneous diffusion. All the models adequately described the NH4+ adsorption process, with r2 values ranging from 0.955 to 0.999. With the exception of first-order kinetics, they also described the desorption process well, with r2 values ranging from 0.897 to 0.999, for all pH and initial NH4+ concentrations. Reaction rate coefficients (k) were calculated from the modified Freundlich model and ranged from 0.134 to 0.193 min-1 for the adsorption process, and 0.129 to 0.226 min-1 for the desorption process. The models indicated that NH4+ adsorption and desorption by the zeolite was diffusion controlled. Data from this study indicated the potential use of the tested natural zeolite as an NH4+ adsorbent and a controlled-release NH4+ fertilizer.

Keywords: Potassium-Calcium Exchange, Phosphate Release, Soil, Sorption, Equations, Systems

Reynolds, J.G., Naylor, D.V. and Fendorf, S.E. (1999), Arsenic sorption in phosphate-amended soils during flooding and subsequent aeration. *Soil Science Society of America Journal*, **63** (5), 1149-1156.

Full Text: [1999\Soi Sci Soc Ame J63, 1149.pdf](1999/Soi%20Sci%20Soc%20Ame%20J63,%201149.pdf)

Abstract: Phosphate enhances the mobility of As in well-aerated soils by competing for adsorption sites. Phosphate and As may also coexist in large concentrations in hydric soils, and the influence of P on As in anaerobic systems is largely unknown. To determine the effects of P on As dynamics during a soil flooding and aeration cycle, samples of two soils were amended with Na2HAsO4 and Na2HPO4 and incubated under a N2 atmosphere for 41 d, and then reaerated for 7 d. Subsamples were collected intermittently and dissolved As, Fe, Mn, Ca, S, P, and H3AsO3 concentrations were determined. Arsenic speciation in the soil solids was determined after 14 and 41 d of flooding and then after 13 h of aeration by X-ray absorption near edge structure (XANES) spectroscopy. Arsenic sorption was small under anaerobic conditions, and H2PO4‾ additions enhanced As(V) reduction rate in both soils and slightly suppressed As sorption in one soil. Arsenopyrite (FeAsS) was identified in the soil solids. Rapid and simultaneous As sorption and Fe precipitation occurred during the first 0.25 d of aeration, suggesting that As was retained on freshly precipitated Fe (hydr)oxides. Manganese precipitation and concomitant As sorption occurred after 1 d of aeration. Arsenopyrite was largely destroyed upon aeration but As(III) persisted. Thus, As is partitioned into the solid phase under both aerobic and anaerobic conditions, although more appreciably under the aerobic conditions of this study, and P has little influence on dissolved As during soil flooding-aeration cycles.

Sarkar, D., Essington, M.E. and Misra, K.C. (1999), Adsorption of mercury(II) by variable charge surfaces of quartz and gibbsite. *Soil Science Society of America Journal*, **63** (6), 1626-1636.

Full Text: [1999\Soi Sci Soc Ame J63, 1626.pdf](1999/Soi%20Sci%20Soc%20Ame%20J63,%201626.pdf)

Abstract: The influence of pH, ionic strength, ligands (Cl, SO4, PO4), and metals (Ni and Pb) on the adsorption of Hg(II) by quartz and gibbsite was investigated to better understand the Hg(II) adsorption process and the impact of metals and ligands on this process. The triple layer model (TLM) was used to simulate Hg(II) adsorption on both surfaces. Mercury(II) adsorption from a 0.6 µM Hg(II) solution varies as a function of pH, increasing to an adsorption maximum with increasing pH before tailing off to a constant level at high pH values. The pH at which maximum Hg(II) adsorption occurs (pHmax ≈ 4.5) is comparable to the pKa (3.2) for the hydrolysis of Hg2+ to form Hg(OH)20. Further, the Hg(II) adsorption edge shifts to much higher pH values in the presence of 0.001 M and 0.01 M Cl, which also corresponds to the pH at which Hg(OH)20 is predicted to form. Only minor deviations in the degree of adsorption and the shape of the Hg(II) adsorption edge are influenced by ionic strength, suggesting the formation of inner-sphere surface complexes. However, Hg(II) adsorption can only be successfully modeled with consideration of the formation of both an outer-sphere surface complex [≡XO‾-HgOH+] and an inner-sphere surface complex [≡XOHg(OH)2‾]. Swamping concentrations (0.01 M) of SO4 and PO4 reduced Hg(II) adsorption on quartz, a result of the predicted formation of Hg(OH)2SO42‾, Hg(OH)2H2PO4‾, and Hg(OH)2-HPO42‾ aqueous species (the adsorption edge and pHmax were not influenced). The presence of SO4 also decreased Hg(II) retention by gibbsite, which was also attributed to the formation of the Hg(OH)2SO42‾ ion pair, however, the presence of PO4 increased Hg(II) retention by gibbsite, which was attributed to the formation of a phosphate bridge [≡AlOPO3Hg(OH)22‾]. Mercury(II) adsorption was decreased in the presence of 14 µM Pb and 48 µM Ni, and most noticeably in the quartz system. The adsorption of Hg(II), when in competition with Pb or Ni, could not be simulated by the TLM without the reoptimization of the Hg(II) outer- and inner-sphere log Kint values. Intrinsic Hg(II) adsorption constants derived from single-element systems could not be employed to simulate adsorption in multi-element, competitive systems.

Shenker, M., Hadar, Y. and Chen, Y. (1999), Kinetics of iron complexing and metal exchange in solutions by rhizoferrin, a fungalsiderophore. *Soil Science Society of America Journal*, **63** (6), 1681-1687.

Full Text: [1999\Soi Sci Soc Ame J63, 1681.pdf](1999/Soi%20Sci%20Soc%20Ame%20J63,%201681.pdf)

Abstract: Rhizoferrin, a siderophore produced by *Rhizopus arrhizus*, has been shown inprevious studies to be an outstanding Fe carrier to plants. Yet, calculations basedon stability constants and thermodynamic equilibrium lead to contradictingconclusions. In this study a kinetic approach was employed to elucidate apparentcontradictions and to determine the behavior of rhizoferrin under conditionsrepresenting soil and nutrient solutions. Stability of Fe3+ complexes in nutrientsolution, rate of metal exchange with Ca, and rate of Fe extraction by the free ligandwere monitored for rhizoferrin and other chelating agents by Fe-55 labeling. Ferriccomplexes of rhizoferrin, desferri-ferrioxamine-B (DFOB) andethylenediamine-di (o-hydroxyphenylacetic acid) (EDDHA) were found to be stablein nutrient solution at pH 7.5 for 31 d, while ferric complexes ofethylenediaminetetraacetic acid (EDTA) and mugineic acid (MA) lost 50% of thechelated Fe within 2 d. Iron-calcium exchange in Ca solutions at pH 8.7 revealedrhizoferrin to hold Pe at nonequilibrium state for 3 to 4 wk at 3.3 mM Ca and forlonger periods at lower Ca concentrations. Ethylenediaminetetraacetic acid lost theferric ion at a faster rate under the same conditions. Iron extraction from freshlyprepared Fe hydroxide at pH 8.7 and with 3.2 mM Ca was slow and followed theorder. DFOB > EDDHA > MA greater than or equal to rhizoferrin > EDTA. Basedon these results we suggest that a kinetic rather than equilibrium approach shouldbe the basis for predictions of Fe chelates’ efficiency. We conclude that thenonequilibrium state of rhizoferrin is of crucial importance for its behavior as an Fecarrier to plants.

Keywords: *Rhizopus-arrhizus*, Plants

Su, C.M. and Suarez, D.L. (2000), Selenate and selenite sorption on iron oxides: An infrared and electrophoretic study. *Soil Science Society of America Journal*, **64** (1), 101-111.

Full Text: [2000\Soi Sci Soc Ame J64, 101.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%20101.pdf)

Abstract: We studied selenate and selenite sorption by amorphous Fe oxide[am-Fe(OH)3] and goethite (α-FeOOH) as a function of time (25min–96 h), pH (3–12), ionic strength (0.01–1.0*M* NaCl), and total Se concentration (0.0001–1.0 *M*). Weexamined sorbed selenate and selenite by in situ attenuatedtotal reflectance Fourier transform infrared (ATR–FTIR)spectroscopy, diffuse reflectance infrared Fourier transform(DRIFT) spectroscopy, and electrophoresis to deduce sorptionmechanisms. Sorption of both selenate and selenite reached equilibriumin < 25 min and the sorption isotherm was not reversible.Increasing ionic strength decreased selenate sorption but didnot affect selenite sorption. The presence of either selenateor selenite lowered the electrophoretic mobility (EM) and decreasedthe point of zero charge (PZC) of both sorbents, suggestinginner-sphere complexation for both selenate and selenite species.Both in situ ATR–FTIR and DRIFT difference spectra showedbidentate complexes of selenate with am-Fe(OH)3. The structureof selenite complexes in am-Fe(OH)3 –solution interfacewas uncertain due to insensitivity of the in situ ATR–FTIRtechnique. The DRIFT spectra of selenite on am-Fe(OH)3 showed ν3 splitting as evidence of complexation. The DRIFT spectra ofselenite on goethite showed bridging bidentate complex of selenite.We conclude that the influence of ionic strength on Se sorptioncannot be used as a criterion for distinguishing outer- vs.inner-sphere complex formation.

Keywords: ATR–FTIR, attenuated total reflectance–Fourier transform infrared, DRIFT, diffuse reflectance infrared Fourier transform, EM, electrophoretic mobility, EXAFS, extended x-ray absorption fine structure, ICP-AES, inductively coupled plasma-atomic emission spectrophotometry, IR, infrared, PZC, point of zero charge

Manning, B.A. and Suarez, D.L. (2000), Modeling arsenic(III) adsorption and heterogeneous oxidation kinetics in soils. *Soil Science Society of America Journal*, **64** (1), 128-137.

Full Text: [2000\Soi Sci Soc Ame J64, 128.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%20128.pdf)

Abstract: Arsenite [As(III)] is a soluble and toxic species of arsenic that can be introduced into soil by geothermal waters, mining activities, irrigation practices, and disposal of industrial wastes. We determined the rates of As(III) adsorption, and subsequent oxidation to arsenate [As(V)] in aerobic soil-water suspensions using four California soils, The rate of As(III) adsorption on the soils was closely dependent on soil properties that reflect the reactivity of mineral surfaces including citrate-dithionite (CD) extractable metals, soil texture, specific surface area, and pH, Heterogeneous oxidation of As(III) to As(V) was observed in all soils studied. The recovery of As(V) from As(III)treated soils was dependent on levels of oxalate-extractable Mn and soil texture, After derivation of rate equations to describe the changes in soluble and recoverable As(III) and As(V) in soil suspensions, soil property measurements were used to normalize the empirically derived rate constants for three soils. The fourth soil, which had substantially different soil properties from the other three soils, was used to independently test the derived soil property-normalized model. The soil property-normalized consecutive reaction model gave a satisfactory description of the trends seen in the experimental data for all four soils. Understanding the effects of soil properties on the kinetics of chemical reactions of As(III) and As(V) in soils will be essential to development of quantitative models for predicting the mobility of As in the field.

Keywords: Arsenite, Arsenate, Sorption, Goethite, Ferrihydrite, Absorption, Retention, Stability, Sediments, Manganese

Strawn, D.G. and Sparks, D.L. (2000), Effects of soil organic matter on the kinetics and mechanisms of Pb(II) sorption and desorption in soil. *Soil Science Society of America Journal*, **64** (1), 144-156.

Full Text: [2000\Soi Sci Soc Ame J64, 144.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%20144.pdf)

Abstract: To improve predictions of the toxicity and threat from Pb contaminatedsoil, it is critical that time-dependent sorption and desorptionbehavior be understood. In this paper, the sorption and desorptionbehavior (pH=5.50, I=0.05 M) of Pb in a Matapeake silt loam soil (Typic Hapludult) were studiedby stirred-flow and batch experiments. In addition, we studiedthe effects of soil organic matter (SOM) on sorption and desorptionbehavior by treating the soil with sodium hypochlorite to removethe SOM fraction, and using a soil with six times as much SOM(St. Johns loamy sand [Typic Haplaquods]) as the Matapeake soil.Lead sorption consisted of a fast initial reaction in whichall of the Pb added to the stirred-flow chamber was sorbed.Following this initial fast reaction, sorption continued andappears to be rate limited (indicated by a decrease in the outflowconcentration when the flow rate was decreased, or when theflow was stopped). The total amount of Pb sorbed was 102, 44, and 27 mmol kg-1 for the St. Johns soil and the untreated andtreated Matapeake soils, respectively. Desorption experimentswere conducted on the soils with the background electrolyteas the eluent in the stirred-flow chamber. In the St. Johnssoil only, 32% of the total sorbed Pb was desorbed, while 47and 76% of the sorbed Pb was released from the untreated andtreated Matapeake soil, respectively. The correlation betweenSOM in the soils, and the percentage Pb desorbed from the soilssuggests that SOM plays an important role in slow desorptionreactions of Pb from soil materials. Aging experiments in whichsorbed Pb was incubated for 1, 10, and 32 d showed that sorptionincubation time had no effect on Pb desorption behavior. Analysisof the treated and untreated Matapeake soils by x-ray absorptionfine structure (XAFS) spectroscopy revealed that the local atomicstructure of sorbed Pb is distinctly different in the two samples.In the soil treated to remove SOM, the data were well representedby theoretical models using O, Si, and Pb backscattering atoms.In the untreated soil, the XAFS data were best described byO and C backscatterers. These XAFS results confirm that thesorption mechanisms in the two systems are different.

Keywords: CV, Chamber Volume, SOM, Soil Organic Matter, XAFS, X-Ray Absorption Fine Structure

Sui, Y.B. and Thompson, M.L. (2000), Phosphorus sorption, desorption, and buffering capacity in a biosolids-amended Mollisol. *Soil Science Society of America Journal*, **64** (1), 164-169.

Full Text: [2000\Soi Sci Soc Ame J64, 164.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%20164.pdf)

Abstract: To investigate the impact of biosolids amendments to soil on the sorption, desorption, and buffering capacity of P, laboratory experiments were conducted on soil samples collected from a field study on a Mollisol amended with three levels of biosolids. The potential for sorption of additional P and the binding intensity of P were evaluated by applying the two-surface Langmuir model to sorption isotherms. Over the range of equilibrium P concentrations in this study, the ability of the soil to sorb added P decreased due to biosolids amendment. Addition of biosolids to the soil also decreased indices of the P-binding intensity at both the high-and low-affinity sites. The P equilibrium buffering capacity (PEBC) significantly decreased and the equilibrium P concentration (EPC) significantly increased after biosolids amendment. P desorption from soil samples with and without biosolids amendment was investigated for different equilibration periods and at various liquid/solid ratios. The amount of P that could be desorbed from the soil significantly increased after biosolids amendment. The effects of biosolids amendments on indices of soil P sorption-desorption phenomena (binding energy, PEBC, and EPC) imply a large increase in the P concentration of the soil solution. The increase of soluble forms of P in soil solution of this soil, which was heavily amended with biosolids, could enhance the loss of P in runoff and P movement below the root zone. [Author abstract, 30 Refs, In English]

Keywords: Adsorption, Equation, Kaolinite, Mobility, Phosphate, Soil-Phosphorus, Two-Surface Langmuir

Barnett, M.O., Jardine, P.M., Brooks, S.C. and Selim, H.M. (2000), Adsorption and transport of uranium(VI) in subsurface media. *Soil Science Society of America Journal*, **64** (3), 908-917.

Full Text: [2000\Soi Sci Soc Ame J64, 908.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%20908.pdf)

Abstract: Uranium(VI) adsorption and transport in three natural, heterogeneous subsurface media were investigated in batch and column experiments. The rate of U(VI) adsorption to the natural samples was rapid over the first few hours of the experiments, and then slowed appreciably after 24 to 48 h. The adsorption of U(VI) to the samples was also nonlinear, suggesting a decreasing attraction for the surface with increased surface loading. The extent of adsorption on each of the media was strongly pH-dependent, increasing sharply as the pH increased from 4.5 to 5.5 and then decreasing sharply over the pH range 7.5 to 8.5 as the concentration of dissolved carbonate and U(VI)-carbonate complexes increased. The similarities in the pH-dependent behavior between the three materials despite differences in bulk mineralogy was likely due to the similar Fe contents of the materials. The transport of U(VI) through packed columns of the soils and sediments was significantly retarded but reversible. The local equilibrium assumption and the batch-measured adsorption isotherms dramatically underestimated the degree of retardation observed in the columns. The U(VI) displacement experiments were modeled with the one-dimensional advective-dispersive equation and several different model formulations describing the interactions of U(VI) with the solid phase. These models were able to fit the observed breakthrough curves within 0.1 root mean square error of the initial concentration.

Sarkar, D., Essington, M.E. and Misra, K.C. (2000), Adsorption of mercury(II) by kaolinite. *Soil Science Society of America Journal*, **64** (6), 1968-1975.

Full Text: [2000\Soi Sci Soc Ame J64, 1968.pdf](2000/Soi%20Sci%20Soc%20Ame%20J64,%201968.pdf)

Abstract: Adsorption of Hg(II) by kaolinite was investigated as a functionof solution pH, ionic strength, and the competitive or complexationeffects of ligands (Cl, SO4, PO4) and metals (Ni and Pb). Mercury(II)adsorption from a 0.6 µ*M* Hg(II) solution was primarilyinfluenced by pH. The Hg(II) adsorption edge was described bya pH50 (pH where 50% adsorption occurs) of 3.4 and a pHmax (pHwhere maximum adsorption occurs) of 4.4. At pH values abovethe pHmax, Hg(II) retention decreased with increasing pH. Chlorideand Ni shifted pH50 from 3.4 to 7 and 4.1, respectively. Nickeland Pb reduced the amount of Hg(II) adsorbed throughout thepH range examined. Ionic strength and the presence of SO4 andPO4 had relatively little impact on the Hg(II) adsorption envelope.The adsorption of Hg(II) was predicted through the applicationof the triple layer model (TLM) by assuming that the kaolinitesurface was composed of equal proportions of silanol and aluminolgroups. The TLM model suggests that the silanol group was responsiblefor retaining the bulk of the adsorbed Hg(II), through the formationof the ≡SiO--HgOH+ outer-sphere, and the ≡SiOHg (OH)2- and ≡SiOHgCl0 or ≡SiOHgOHCl- (Cl system) inner-sphere species.The ≡AlO--HgOH+ outer-sphere complex accounted for a small percentage(<15–35%) of the adsorbed Hg(II). The TLM results suggestedthat Hg(II) adsorption by both ≡SiOH and ≡AlOH sites on kaoliniteshould be considered to predict adequately Hg(II) retention.

Keywords: IS, ionic strength, TLM, triple layer model

Matocha, C.J., Sparks, D.L., Amonette, J.E. and Kukkadapu, R.K. (2001), Kinetics and mechanism of birnessite reduction by catechol. *Soil Science Society of America Journal*, **65** (1), 58-66.

Full Text: [2001\Soi Sci Soc Ame J65, 58.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%2058.pdf)

Abstract: The complex interactions of oxidizable organic ligands with soil Mn(III, IV) (hydr)oxide minerals have received little study by in situ spectroscopic techniques. We used a combination of an in situ electron paramagnetic resonance stopped-flow (EPR-SF) spectroscopic technique and stirred-batch studies to measure the reductive dissolution kinetics of birnessite (delta -MnO2), a common Mn mineral in soils, by catechol (1,2-dihydroxybenzene). The reaction was rapid, independent of pH, and essentially complete within seconds under conditions of excess-catechol at pH 4 to 6. The overall empirical second-order rate equation describing the reductive dissolution rate was d[Mn(II)]/ dt = k[CAT](1.0)[SA](1.0) where k = 4 (±0.5) (10-3 L m-2 s-1 and [CAT] and [SA] are the initial concentrations in molarity and meters square per liter. In the process, catechol was oxidized to the two-electron o-quinone product. The energy of activation (E.) for the reaction was 59 (±7) kJ mol-1 and the activation entropy (SI) was -78±225 mol-1 K-1, suggesting that the reaction was surface-chemical controlled and occurs by an associative mechanism. Rates of catechol disappearance from solution with simultaneous Mn(II) and o-quinone production were comparable. These data strongly suggest that precursor surface-complex formation is rate-limiting and that electron transfer is rapid, The rapid reductive dissolution of birnessite by catechol has significant implications for C and Mn cycling in soils and the availability of Mn to plants.

Keywords: Electron-Spin-Resonance, Dilute Aqueous Suspensions, Na-Rich Birnessite, Manganese Oxides, Xanes Spectroscopy, Oxidation-State, Hexagonal Birnessite, Surface Complexation, Reaction-Products, Mn(IV) Oxide

Harter, R.D. and Naidu, R. (2001), An assessment of environmental and solution parameter impact on trace-metal sorption by soils. *Soil Science Society of America Journal*, **65** (3), 597-612.

Full Text: [2001\Soi Sci Soc Ame J65, 597.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%20597.pdf)

Abstract: When studying metal sorption by soils, the potential influenceof environmental and solution parameters on the experimentalsystems cannot be ignored. Characteristics of the soil mineralsurfaces are the final determinative factors in whether a metalion will be sorbed, but soil-solution composition affects bothmineral surface properties and whether the metal ions will bein forms that can react with the surfaces. Examples of factorsaffecting sorption of metals by soil surfaces include ionicstrength, cations, anions, and/or organic ligands present insolution, solution pH, and solution metal concentration. Inaddition, sorption will be affected by external factors suchas pressure, temperature, soil/solution ratio, and the mannerin which soils to be studied are sampled and stored before investigation.To date, there has been little attempt to standardize experimentalprotocol, so results obtained using varied systems in differentlaboratories cannot be readily compared. An initial suggestionthat all sorption studies include at least one treatment meetingminimal standards of ionic strength (0.01), background electrolyte(NaNO3), pH (between 5.5 and 6.0), and temperature (25±3°C) is presented as a first step toward enabling improvedability to make interlaboratory comparisons.

Keywords: DOC, dissolved organic carbon, DOM, dissolved organic matter, I, ionic strength, PDI, potential-determining ion, PZNC, Point of Zero Net Charge

Saha, U.K., Taniguchi, S. and Sakurai, K. (2001), Adsorption behavior of cadmium, zinc, and lead on hydroxyaluminum– and hydroxyaluminosilicate–montmorillonite complexes. *Soil Science Society of America Journal*, **65** (3), 694-703.

Full Text: [2001\Soi Sci Soc Ame J65, 694.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%20694.pdf)

Abstract: The current imperfect understanding about the adsorption behaviorof heavy metals on hydroxyaluminum (HyA)- and hydroxyaluminosilicate(HAS)-interlayered phyllosilicates led us to conduct this study.We examined the adsorption behavior of Cd, Zn, and Pb on syntheticallyprepared HyA– and HAS–montmorillonite (Mt) complexesin comparison with that on untreated Mt. A very dilute initialmetal concentration of 10-6 *M* in 0.01 *M* NaClO4 background wasused in all the adsorption systems. The presence of HyA andHAS polymers on Mt greatly promoted the adsorption of all threemetals. Such promoting effects of HyA and HAS polymers on themetal adsorption were, however, not very different from eachother. The observed adsorption selectivity sequences of Pb >Zn > Cd on Mt as well as Pb >> Zn ≥ Cd on the complexes resemblethe reported metal selectivity sequences on amorphous Fe andAl hydroxides. At different pHs, partitioning the adsorbed metalsinto strongly and weakly held fractions indicated that specificadsorption rather than nonspecific adsorption might have largelycontrolled the metal selectivity, particularly on the complexes.This led us to assume a predominant involvement of interlayeredHyA or HAS polymers in metal adsorption from such dilute solutions.On Mt, the metals were predominantly adsorbed on the permanentcharge sites in an easily replaceable state. However, a substantialinvolvement of the edge OH- groups of Mt in specific adsorptionof the metals was also evident, especially at higher pH. Obviously, on Mt and on the complexes, the relative abundance of each typeof site and their affinity to heavy metals were substantiallydifferent.

Keywords: CEC, cation-exchange capacity, HAS, hydroxyaluminosilicate, HRTEM, high-resolution transmission electron microscopy, HSAB, hard–soft acid base, HyA, hydroxyaluminum, IAP, ion activity product, ICP-AES, inductively coupled plasma–atomic emission spectroscopy, M, metal, MT, montmorillonite, SA, strongly adsorbed, TA, total adsorbed, VT, vermiculite, WA, weakly adsorbed, XRD, x-ray diffraction

Scheckel, K.G. and Sparks, D.L. (2001), Temperature effects on nickel sorption kinetics at the mineral-water interface. *Soil Science Society of America Journal*, **65** (3), 719-728.

Full Text: [2001\Soi Sci Soc Ame J65, 719.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%20719.pdf)

Abstract: In recent years, innovative studies have shown that sorption of metals onto natural materials results in the formation of new mineral-like precipitate phases that increase in stability with aging time. While these findings have demonstrated the usefulness of current state-of-the-art molecular-scale methods for confirming macroscopic data and elucidating mechanisms, basic kinetic and thermodynamic parameters for the formation of the metal precipitates have not been examined. This study examined Ni-sorption kinetics on pyrophyllite, talc, gibbsite, amorphous silica, and a mixture of gibbsite and amorphous silica over a temperature range of 9 to 35 degreesC. Using the Arrhenius and Eyring equations, we calculated the energy of activation (E-a) and enthalpy (ΔH°), entropy (ΔS°), and free energy of activation (ΔG°), related to the formation of the Ni precipitates. Based on values of E-a (93.05 to 123.71 kJ mol-1) and DeltaS° (-27.51 to -38.70 J mol-1), Ni sorption on these sorbents was surface-controlled and an associative mechanism, The DeltaH(double dagger) values (90.60 to 121.26 kJ mol-1) suggest, as indicated by E-a values, that an energy barrier was present for the system to overcome in order for the reaction to occur, Additionally, the large, positive ΔG° values suggest there is an energy barrier for product formation. Although metal precipitation reactions often occur in the natural environment, this study shows that the rate of these reactions depends strongly on temperature.

Keywords: X-Ray-Absorption, Electron-Paramagnetic-Resonance, Surface Precipitation, Dissolution Kinetics, Metal Sorption, Oxide Minerals, Pyrophyllite, Adsorption, Clay, Spectroscopy

Gomes, P.C., Fontes, M.P.F., da Silva, A.G., Mendonça, E.D.S. and Netto, A.R. (2001), Selectivity sequence and competitive adsorption of heavy metals by brazilian soils. *Soil Science Society of America Journal*, **65** (4), 1115-1121.

Full Text: [2001\Soi Sci Soc Ame J65, 1115.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%201115.pdf)

Abstract: Heavy-metal cations can be introduced into agricultural soilsby application of fertilizers, liming materials, sewage sludge, composts, and other industrial and urban waste materials. Therefore, heavy-metal adsorption reactions, in a competitive system, areimportant to determine heavy-metal availability to plants andtheir mobility throughout the soil. This study was conductedto evaluate the selectivity sequence and estimate the competitiveadsorption of several heavy metals in seven soils with differentchemical and mineralogical characteristics. Distribution coefficients(Kd), which represent the sorption affinity of metals for thesolid phase, were obtained for each soil and heavy-metal cation.On the basis of these Kd, the selectivity sequence was evaluated.The most common sequences were Cr > Pb > Cu > Cd > Zn > Ni andPb > Cr > Cu > Cd > Ni > Zn. Chromium, Pb, and Cu were the heavy-metalcations most strongly adsorbed by all soils, whereas Cd, Ni, and Zn were the least adsorbed, in the competitive situation.Selectivity sequences related to valence for the trivalent Cr.For metals of the same valence, sequences did not exactly followthe order of electronegativity. For individual elements, theMisono softness parameter and hydrolysis properties of the heavy-metalcations may have influenced the sequences. Correlation analysisshowed that soil characteristics that may have affected theheavy-metals adsorption, represented by the distribution coefficients, were pH and cation-exchange capacity (CEC) for Cd and Cr, organiccarbon, clay, and gibbsite contents for Cu, pH and CEC for Niand Pb.

Keywords: ALF, Alfisol, CECef, effective cation-exchange capacity, CECtot, total cation-exchange capacity, Gibb, gibbsite, Goet, goethite, Hem, hematite, Kao, kaolinite, *K*d, distribution coefficients, OC, organic carbon, OX1, Oxisol number 1, OX2, Oxisol number 2, OX3, Oxisol number 3, OX4, Oxisol number 4, UL1, Ultisol number 1, UL2, Ultisol number 2, ΣOxi, sum of oxide content

Notes: highly cited

Grafe, M., Eick, M.J. and Grossl, P.R. (2001), Adsorption of arsenate(V) and arsenite(III) on goethite in the presence and absence of dissolved organic carbon. *Soil Science Society of America Journal*, **65** (6), 1680-1687.

Full Text: [2001\Soi Sci Soc Ame J65, 1680.pdf](2001/Soi%20Sci%20Soc%20Ame%20J65,%201680.pdf)

Abstract: The environmental fate of arsenic (As) is of utmost importance as the public and political debate continues with the USEPA’s recent proposal to tighten the As drinking water standard from 50 to 10 μg L-1. In natural systems, the presence of dissolved organic C (DOC) may compete with As for adsorption sites on mineral surfaces, hence increasing its potential bioavailability. Accordingly, the adsorption of arsenate [As(V)] and arsenite [As(III)] on goethite (alpha -FeOOH) was investigated in the presence of either a peat humic acid (Hap), a Suwannee River Fulvic Acid (FA) (international Humic Substances Society, St. Paul, MN), or citric acid (CA). Adsorption edges and kinetic experiments were used to examine the effects of equimolar concentrations of organic adsorbates on As adsorption. Adsorption edges were conducted across a pH range of 3 to 11, while the kinetic studies were conducted at pH 6.5 for As(V) and pH 5.0 for As(III). Both Hap and FA decreased As(V) adsorption, while CA had no effect. Humic acid reduced As(V) between pH 6 and 9 by approximate to 27%. Fulvic acid inhibited As(V) adsorption between pH 3 and 8 by a maximum of 17%. Arsenite adsorption was decreased by all three organic acids between pH 3 and 8 in the order of CA > FA approximate to Hap. The different pH regions in which Hap and FA decreased As(V) adsorption suggest that more than one functional group on these complex organic polymers may be responsible for binding to the alpha -FeOOH surface. Similarly, the relative surface affinity of the As(III or V) species and that of the competing organic ligand as a function of pH may play a major role in the outcome of As adsorption on alpha -FeOOH. The results of these experiments suggest that DOC substances are capable of increasing the bioavailability of As in soil and water systems in which the dominant solid phase is a crystalline iron oxide.

Keywords: Chromate Retention Mechanisms, Competitive Adsorption, Fulvic-Acid, Phosphate, Sorption, Minerals, Oxide, Soils, Complexation, Gibbsite

Goldberg, S. (2002), Competitive adsorption of arsenate and arsenite on oxides and clay minerals. *Soil Science Society of America Journal*, **66** (2), 413-421.

Full Text: [2002\Soi Sci Soc Ame J66, 413.pdf](2002/Soi%20Sci%20Soc%20Ame%20J66,%20413.pdf)

Abstract: Arsenic adsorption on amorphous Al and Fe oxides and the clayminerals, kaolinite, montmorillonite, and illite was investigatedas a function of solution pH and As redox state, i.e., arsenite[As(III)] and arsenate [As(V)]. Arsenic adsorption experimentswere carried out in batch systems to determine adsorption envelopes, amount of As(III), As(V), or both adsorbed as a function ofsolution pH per fixed total As concentration of 20 µMAs. Arsenate adsorption on oxides and clays was maximal at lowpH and decreased with increasing pH above pH 9 for Al oxide, pH 7 for Fe oxide and pH 5 for clays. Arsenite adsorption exhibitedparabolic behavior with an adsorption maximum around pH 8.5for all materials. There was no competitive effect of the presenceof equimolar arsenite on arsenate adsorption. The competitiveeffect of equimolar arsenate on arsenite adsorption was smalland apparent only on kaolinite and illite in the pH range 6.5to 9. The constant capacitance model was able to fit the arsenateand arsenite adsorption envelopes to obtain values of the intrinsicAs surface complexation constants. These intrinsic surface complexationconstants were then used in the model to predict competitivearsenate and arsenite adsorption from solutions containing equimolarAs(III) and As(V) concentrations. The constant capacitance modelwas able to predict As adsorption from mixed As(III)-As(V) solutionsin systems where there was no competitive effect.

Keywords: EM, Electrophoretic Mobility, EXAFS, X-Ray Absorption Fine Structure, FTIR, Fourier Transform Infrared Spectroscopy, PZC, Point of Zero Charge

Waltham, C.A. and Eick, M.J. (2002), Kinetics of arsenic adsorption on goethite in the presence of sorbed silicic acid. *Soil Science Society of America Journal*, **66** (3), 818-825.

Full Text: [2002\Soi Sci Soc Ame J66, 818.pdf](2002/Soi%20Sci%20Soc%20Ame%20J66,%20818.pdf)

Abstract: The potential toxicity and availability of As in the environmentis dependent on several factors including redox potential, pH, and the presence of ligands that can compete for adsorptionsites on mineral surfaces. Silicic acid is a ligand ubiquitousin natural systems and strongly chemisorbs to Fe oxides. However, there are relatively few studies examining its influence onAs adsorption on Fe oxides. This study examined the influenceof silicic acid (0.10 and 1.0 m*M*) on the adsorption kineticsof arsenite and arsenate (0.10 m*M*) on goethite over a rangeof common soil pH values (4, 6, and 8). The rate of arsenic(III and V) and silicic acid adsorption was greatest at pH valuesnear their pK1 value. However, silicic acid sorption was characterizedby biphasic kinetics with rapid adsorption followed by a muchslower adsorption reaction. The rate and total quantity of arseniteadsorption decreased in the presence of silicic acid at allpH values and concentrations of silicic acid. Approximately40% less arsenite was adsorbed in the presence of 1.0 m*M* silicicacid at all pH values. At 0.10 m*M*, silicic acid had less ofan effect on arsenite adsorption. In contrast, only the rateand not the total quantity of arsenate was reduced in the presenceof silicic acid. The rate of arsenate adsorption decreased aspH and silicic acid concentration increased. This was attributedto a decrease in the goethite’s surface potential upon specificadsorption of silicic acid and deprotonation of the arsenatemolecule creating an unfavorable electrostatic field. Theseresults demonstrate the importance of evaluating As speciation, reaction kinetics, and the influence of naturally occurringligands on the adsorption of As on variable charge surfaces.

Keywords: FESEM, Field Emission Scanning Electron Microscopy, PZC, Point of Zero Charge, TGA, Thermal Gravimetric Analysis, XRD, X-Ray Diffraction

Violante, A. and Pigna, M. (2002), Competitive sorption of arsenate and phosphate on different clay minerals and soils. *Soil Science Society of America Journal*, **66** (6), 1788-1796.

Full Text: [2002\Soi Sci Soc Ame J66, 1788.pdf](2002/Soi%20Sci%20Soc%20Ame%20J66,%201788.pdf)

Abstract: Sorption and desorption of AsO4 on or from different soil componentsmay have a dominant role in regulating As mobility in soils.The objectives of this work were to provide information on thefactors that influence the competitive sorption of AsO4 andPO4 in soil. We studied the competitive sorption of PO4 andAsO4 on selected phyllosilicates, metal oxides, synthetic organo-mineralcomplexes, and soil samples as affected by pH (4.0–8.0), ligands concentration, surface coverage of the oxyanions onthe samples and the residence time. We found that Mn, Fe, andTi oxides and phyllosilicates particularly rich in Fe (nontronite, ferruginous smectites) were more effective in sorbing AsO4 thanPO4. In fact, by adding AsO4 and PO4 as a mixture (AsO4/PO4molar ratio of 1) more AsO4 than PO4 was usually sorbed on birnessite, pyrolusite, goethite, nontronite, and ferruginous smectite, but more PO4 than AsO4 was sorbed on noncrystalline Al precipitationproducts, gibbsite, boehmite, allophane, and kaolinite. Forexample, at pH 5.0 the sorbed AsO4/sorbed PO4 molar ratio (rf)was 1.81 for birnessite, 1.05 for nontronite, but was only 0.45for kaolinite and 0.14 for allophane. For montmorillonite, illite, and vermiculite the rf values were slightly <1. For soilsamples, particularly rich in kaolinite, halloysite, allophane, and containing relatively large amounts of organic C, the rfvalues were usually much <1. For all the samples, the rfvalues increased by decreasing the pH and with the residencetime of the oxyanions. The sorption of AsO4 (or PO4) on goethiteand gibbsite decreased by increasing the initial PO4/AsO4 (orAsO4/PO4 molar ratio) up to 2.0. However, PO4 inhibited AsO4sorption more on gibbsite than on goethite, whereas AsO4 preventedPO4 sorption more on goethite than on gibbsite. The data reportedin this paper suggest that the mobility, the bioavailability, and the toxicity of As in soil environments may be greatly affectedby the nature of soil components, pH, presence of anions (PO4), and residence time.

Keywords: AlD, Al Extracted by Na-Dithionite-Citrate, AlO, Al Extracted by NH4-Oxalate, EGME, Ethyleneglycol Monoethylether, FeD, Fe Extracted by Na-Dithionite-Citrate, FeO, Fe Extracted by NH4-Oxalate, IEP, Isoelectric Point, IMt-2, Montana illite, KGa-1, Georgia kaolinite, OOMWW, Olive Oil Mill Waste Water, PZC, Point of Zero Charge, PZSE, Point of Zero Salt Effect, RF, Molar Ratio, SWy-1, Wyoming Montmorillonite, TEM, Transmission Electron Microscopy, XRD, X-Ray Diffraction

Saha, U.K., Liu, C., Kozak, L.M. and Huang, P.M. (2004), Kinetics of selenite adsorption on hydroxyaluminum- and hydroxyaluminosilicate-montmorillonite complexes. *Soil Science Society of America Journal*, **68** (4), 1197-1209.

Full Text: [2004\Soi Sci Soc Ame J68, 1197.pdf](2004/Soi%20Sci%20Soc%20Ame%20J68,%201197.pdf)

Abstract: A lack of understanding about the selenite adsorption behavior on hydroxyaluminum (HyA)- and hydroxyaluminosilicate (HAS)- interlayered phyllosilicates led us to conduct the present study. The kinetics of selenite adsorption on montmorillonite (Mt), HyA(OH/ Al = 2.0)-Mt, HAS1(OH/Al = 2.0, Si/Al = 0.24)-Mt, and HAS2(OH/ Al = 2.0, Si/Al = 0.48)-Mt were studied at pH 4.5, with an initial selenite concentration of 0.025 mM, a clay concentration of 0.5 g L-1, temperatures of 288, 298, 308, and 318 K, and background electrolyte concentration of 10-2 M NaNO3. Of the six different kinetic models tested, the second-order rate equation best described the kinetic data obtained for the initial fast reaction (5-30 min) followed by a slow reaction (30-180 min) in the adsorption systems. Elevated temperatures brought about a substantial increase in the rate constants. Compared with Mt, different HyA/HAS-Mts had 2 to 21 times higher rate constants for the fast reaction and up to five times higher rate constants for the slow reaction. Silication of HyA-Mt to form HAS1-Mt and HAS2-Mt substantially lowered the rate constants for both the fast and slow reactions. For the fast reaction, Mt had the highest activation energy and HyA-Mt had the lowest activation energy (around four times lower than Mt), silication increased the activation energy of selenite adsorption on the HAS-Mts. The pre-exponential factor, an index of the frequency of selenite collision with the clay surface, was remarkably lower for the HyA/HAS-Mts in comparison with Mt. The data obtained in the present study are of fundamental significance in understanding the role of Al interlayering and coating and silication of Al polymers on expansible phyllosilicates in influencing the dynamics of Se in soil and related environments.

Keywords: Hydroxy-Aluminosilicate Ions, Expansible Layer Silicates, Phosphate Adsorption, Charge Characteristics, Aluminum Hydroxides, Anion Adsorption, Proto-Imogolite, Electric Charge, Iron-Oxides, Surface

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Full Text: [2007\Soi Sci Soc Ame J71, 1796.pdf](2007/Soi%20Sci%20Soc%20Ame%20J71,%201796.pdf)

Abstract: One of the most commonly used models for describing solute sorption to soils is the Langmuir model. Because the Langmuir model is nonlinear, fitting the model to sorption data requires that the model be solved iteratively using an optimization program. To avoid the use of optimization programs, a linearized version of the Langmuir model is often used so that model parameters can be obtained by linear regression. Although the linear and nonlinear Langmuir equations are mathematically equivalent, there are several limitations to using linearized Langmuir equations. We examined the limitations of using linearized Langmuir equations by fitting P sorption data collected on eight different soils with four linearized versions of the Langmuir equation and comparing goodness-of-fit measures and fitted parameter values with those obtained with the nonlinear Langmuir equation. We then fit the sorption data with two modified versions of the Langmuir model and assessed whether the fits were statistically superior to the original Langmuir equation. Our results demonstrate that the use of linearized Langmuir equations needlessly limits the ability to model sorption data with good accuracy. To encourage the testing of additional nonlinear sorption models, we have made available an easily used Microsoft Excel spreadsheet (ars.usda.gov/msa/awmru/ bolster/Sorption\_spreadsheets) capable of generating best-fit parameters and their standard errors and confidence intervals, correlations between fitted parameters, and goodness-of-fit measures. The results of our study should promote more critical evaluation of model fits to sorption data and encourage the testing of more sophisticated sorption models.

Keywords: Nonlinear Least-Squares, Purpose Adsorption-Isotherms, Phosphorus Sorption Capacity, Estimating Michaelis-Menten, Minnesota River-Basin, Regression-Analyses, Runoff Phosphorus, Calcareous Soils, Curve-Fit, Constants

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Full Text: [2009\Soi Sci Soc Ame J73, 560.pdf](2009/Soi%20Sci%20Soc%20Ame%20J73,%20560.pdf)

Abstract: The mechanism of P sorption onto soils has a strong impact on bioavailability and transport potential. Assessment of sorption energy via isothermal titration calorimetry (ITC) can potentially provide information on P sorption mechanisms. This study used ITC to examine P sorption onto poorly crystalline Georgia kaolinite at pH 4.3 and 6.3. A complementary sorption and desorption isotherm was also conducted at the same kaolinite/solution ratio as the titration experiment. In addition, other ITC experiments were performed to help interpret the kaolinite-P thermograms. Thermograms (measured heat response) for titration of P into pH 4.3 kaolinite indicated initial fast exothermic followed by slower endothermic reactions, both reactions decreased with further P additions. By the eighth titration, the net reaction turned from exothermic to endothermic, indicating that the endothermic reaction now dominated. The complementary sorption isotherm indicated a statistically significant “breakpoint” at this same P addition. In contrast, pH 6.3 kaolinite exhibited only exothermic reactions during P titrations. Based on sorption isotherms, solution thermodynamic modeling, and supporting ITC experiments, the exothermic reaction indicated P sorption onto kaolinite by ligand exchange and dissolution or protonation of kaolinite while the endothermic reaction indicated Al phosphate precipitation. Sequential desorption isotherm results showed that although the pH 4.3 and 6.3 kaolinite desorbed the same amount of P when normalized for initial surface P concentrations, kaolinite at pH 4.3 desorbed P at a greater rate than at pH 6.3. Compared with traditional solid-state techniques, ITC provides continuous data collection as reactions are occurring, rather than discrete observations.

Keywords: Amorphous Aluminum Hydroxides, Anion-Exchange, Availability, Bioavailability, Data Collection, Desorption, Dissolution, Endothermic, Eutrophication, Flow Calorimetry, Impact, Ionic-Strength, Isotherm, Isotherms, Kaolinite, Mechanism, Modeling, Phosphate, Phosphate Adsorption, Phosphorus, Soils, Sorption, Sorption Isotherm, Thermodynamic, Transport

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Full Text: [2009\Soi Sci Soc Ame J73, 1808.pdf](2009/Soi%20Sci%20Soc%20Ame%20J73,%201808.pdf)

Abstract: Environmental nanoparticles exist in the hydrosphere, pedosphere, biosphere, and atmosphere. Their biogeochemical and ecological impacts are some of the fastest growing areas of research today. However, efficient separation of environmental nanoparticles remains difficult. The objective of this study was to develop an automated ultrafiltration device (AUD) for efficient collection of environmental nanoparticles. The AUD utilizes an automated hydraulic ram to facilitate collection of nanoparticles using the ultrafiltration membrane with pore size in the range of 1 to 100 nm. Zeolite A was used as a model nanoparticle sample to demonstrate the efficiency of the AUD. The size distribution and mean particle sizes determined by zeta-sizer analysis on the collected nanoparticles and their transmission electron micrographs indicate the adequacy of the AUD developed in this study in collecting nanoparticles (1-100 nm). Because of its ability to reduce the time needed for sample collection, coupled with the quantity of nanoparticles collected, the AUD was far more efficient than the conventional syringe method for collecting nanoparticles. The AUD has the characteristics of automation, easy operation, and high efficiency in the separation of nanoparticles and would, thus, facilitate future research and developments in environmental nanoscience and nanotechnology and their impacts on the ecosystem.

Keywords: Cross-Flow Ultrafiltration, River Superfund Complex, Size Analysis, Heavy-Metals, Colloids, Fractionation, Water, Microfiltration, Oxides, Nanotechnology

? Wang, Y.J., Cui, Y.X., Zhou, D.M., Wang, S.Q., Xiao, A.Y., Wang, R.H. and Zhang, H.L. (2009), Adsorption kinetics of glyphosate and copper(II) alone and together on two types of soils. *Soil Science Society of America Journal*, **73** (6), 1995-2001.

Full Text: [2009\Soi Sci Soc Ame J73, 1995.pdf](2009/Soi%20Sci%20Soc%20Ame%20J73,%201995.pdf)

Abstract: Glyphosate [N-(phosphonomethyl)glycine] is a nonselective, postemergence herbicide that contains multiple functional groups, which can form strong coordination with metal cations to give bidentate and tridentate complexes. The complexation of glyphosate with metal cations may affect their distribution and bioavadability in sods. Adsorption kinetics of glyphosate and Cu(II) alone and together were studied using a continuous flow experimental setup on two soils with different characteristics at pH5.5. Four kinetic models, i.e., the Lagergren first-order, pseudo-second-order, Elovich, and power function equations, were successfully used to describe their adsorption kinetics. Among the four models, the Lagergren first-order kinetic model fit the experimental data of glyphosate and Cu(II) adsorption the best. Glyphosate significantly increased the adsorption quantity of Cu(II) on the Red soil (a Hapludult or Udic Ferrosol), due to the fact that Cu(II) was adsorbed on the sites where glyphosate had been strongly adsorbed. Glyphosate decreased the adsorption of Cu(II) on the Wushan soil (a Haplaquept or Anthrosol), however, because adsorption of glyphosate on this soil was weak and the complex of glyphosate and Cu(II) tended to be highly soluble in water, thus preventing Cu(II) from exchanging with Ca2+ and Mg2+ ions on the soil surface. On the other hand, the presence of Cu(II) decreased the adsorption of glyphosate on both soils, which may be attributed to the lower affinity of the Cu(II)-glyphosate complex to the soils than glyphosate alone.

Keywords: Adsorption, Adsorption Kinetics, Characteristics, Complexation, Coordination, Copper(II), Cosorption, Cu(II), Data, Distribution, Elovich, Experimental, First Order, First-Order Kinetic Model, Flow, FTIR, Function, Functional Groups, Goethite, Herbicide, Ions, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Metal, Model, Models, Montmorillonite, Power, Pseudo Second Order, Pseudo-Second-Order, Soil, Soils, Sorption, Surface, Water, Zinc

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Full Text: [2011\Soi Sci Soc Ame J75, 1394.pdf](2011/Soi%20Sci%20Soc%20Ame%20J75,%201394.pdf)

Abstract: The adsorption of chlorimuron-ethyl in two typical northeastern Chinese soils before and aft er removal of organic matter and removal of organic matter plus iron/aluminum oxides was investigated using batch equilibrium methods, and the effect of pH on the adsorption was also evaluated. The adsorption kinetics were fitted well with the Elovich and pseudo-second-order kinetic models (R(2) = 0.973-0.985) and the adsorption isotherms conformed to the Linear, Freundlich, and Langmuir models (R(2) > 0.963). The mineral fraction appeared to dominate adsorption of chlorimuron-ethyl in brown earth (BE; Alfisols), while organic matter was the major component for the adsorption in black soil (BS; Mollisols). The adsorption of chlorimuron-ethyl in the original and treated soils all decreased with increasing pH. Moreover, the effect of pH on the adsorption of chlorimuron-ethyl in soil minerals was stronger than that in organic matter at acidic conditions.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Bensulfuron-Methyl, Desorption, Equilibrium, Ethametsulfuron-Methyl, Freundlich, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Metsulfuron-Methyl, Organic Amendment, pH, Removal, Soil, Soils, Sorption, Sorption, Desorption Behavior, Sulfonylurea Herbicides, Tandem Mass-Spectrometry, Thifensulfuron-Methyl

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Abstract: The degree to which cations which form weak bases are sorbed in excess of cations which form strong bases is shown to be about 10% in montmorillonite and 40% in peat. These excesses were accounted for by a special reaction mechanism which was revealed when layer silicate clays or peat fractions were examined by an infrared absorption technique. Copper and zinc saturation decreased the 2.8 micron hydroxyl absorption intensity of montmorillonite, vermiculite, and kaolinite, indicating a reaction with octahedral OH in the layer silicates. The larger OH peak of kaolinite at 2.7 microns was not affected. Also, the copper treatment yielded an additional pair of absorption peaks at 6.4 and 7.0 microns. Aluminum and iron treatment tended to increase the 2.8 micron peak slightly. Copper and zinc saturation of peat fractions resulted in numerous shifts in the double bond region of the spectrum, which were indicative of chelation with C = O and N = O groups.

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Abstract: The quantitative relationship between temperature and nitrification rates was determined in four different soils under laboratory conditions. The formation of nitrates took place at all temperatures studied between 2 and 35° C. when other factors were favorable. The rate of nitrification increased with temperature with the greatest increase between 7 and 15° C.

In Genesee silt loam (pH 7.7) nitrate nitrogen was formed at rates of 2, 10, 45, 60, 90, and 120 ppm. per week at 2, 7, 15.5, 21, 27, and 35° C., respectively, until the 200 ppm. ammonium nitrogen (NH4 -N) added was oxidized. The maximum rate in the Mellott C horizon (pH 7.8) was nearly equal to that achieved in the Genesee; the rate in the Chalmers silty clay loam (pH 6.2) was intermediate; the slowest rates found occurred in the Clermont silt loam (pH 5.0) which had maximum rates of 0, 0, 25, 30, 30, and 15 ppm. per week at the temperatures from 2 to 35° C. given above. The initial rate in the Mellott C and Clermont was much slower than the maximum rate. After 4 weeks the rate decreased in the Chalmers and Clermont, probably due to increased acidity.

A marked decrease in the rate of nitrification occurred as the pH dropped below neutrality. Change of pH by adding calcium carbonate did not change the temperature range of nitrification in Clermont silt loam. Differences in temperature range existed between the soils as well as differences in the rate of nitrification.

Temperatures fluctuating in a 24-hour cycle generally resulted in an increased rate of nitrification at temperatures below 15.5° C. and a decreased rate above 15.5° C. in Genesee silt loam.

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Abstract: Nitrification of ammonium sulfate as influenced by temperature was studied in 3 Iowa soils in the laboratory and in 1 soil under field conditions over a fall and winter season. Laboratory temperatures ranged from 8° to 30° C. and soil temperature in the field varied from freezing to about 20° C.

General relationships were established between temperatures and nitrification rates in given soils. Nitrification rate decreased with diminution in soil temperature; however, the relationship was not linear over the entire temperature range. At given temperatures, ammonia oxidation rates differed between soils studied, but the temperature-nitrification rate curves for the 3 soils were similar and differed only by a constant factor.

Of particular importance to this study was the influence exerted on nitrification by temperature as it decreased from optimum to critically low temperatures. Complete inhibition was not attained until soil temperatures approached the freezing point. Only slight oxidation of ammonium occurred, however, under field conditions in soils that were fertilized after soil temperatures had decreased below 50° F.

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Abstract: Data presented suggest that the rate of K release from biotite by leaching with NaCl is independent of the amount of K in the mineral during the depletion of a large proportion of the total K content. Optical and X-ray diffraction data show that weathering of biotite to vermiculite proceeds from the outside edge in toward the center of the particle. The 14Å. layers were found to have about 4 times the diffraction intensity of the 10Å. layers. Observation was made of the actual weathering front. The dependence of rate of K release on leaching rate, NaCl concentration, temperature, time, and particle size was evaluated and an empirical equation derived relating these variables. A theory is presented that the apparent zero-order type of reaction results from the maintenance of a constant concentration of reactive K similar to the principle of a saturated solution of a material in equilibrium with its solid phase. The logarithmic portion of the curve is suggested as the place where a “saturated solution” of reactive K can no longer be maintained and rate of release becomes dependent on the amount of unreacted K.

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Full Text: [-1959\Soi Sci Soc Ame Pro23, 363.pdf](-1959/Soi%20Sci%20Soc%20Ame%20Pro23,%20363.pdf)

Abstract: Rate of release of fixed K from vermiculite with 0.1N NaCl was studied to attempt to characterize the ratelimiting process. Of the processes considered, film diffusion satisfied most criteria as rate limiting. The activation energy of the release of K by 0.1N NaCl in the system studied was about 3,550 cal./mole, a value of the order frequently obtained for diffusion processes.

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Full Text: [1960-80\Soi Sci Soc Ame Pro25, 349.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro25,%20349.pdf)

Abstract: The influence of temperature and moisture on the release of nonexchangeable K to the exchangeable form was studied in the laboratory. Varying moisture from 60 to 100% of moisture equivalent was found to have no effect on the release of nonexchangeable K at temperatures from 1° to 80° C. Temperature caused increases in the level of exchangeable K in all but one case. The higher the temperature, the greater was the rate of release of nonexchangeable K.

The first release of K appeared to conform to a first-order reaction, while subsequent release was of a zero-order nature. Activation energies were determined from data obtained by the incubation of soils at three temperatures. These values were in the range of 11,000 to 26,000 cal. per mole.

Data obtained by oven-drying soils before and after incubation at 118° C. indicate that the increases in exchangeable K obtained by these two methods were due to different reactions.

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Full Text: [1960-80\Soi Sci Soc Ame Pro26, 437.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro26,%20437.pdf)

Abstract: A mathematical expression that describes the release of interlayer K from mica particles in NaCl-NaTPB solutions was derived. The mica particles were assumed to be circular discs and the rate determining process for the release of K was considered to be the simultaneous diffusion of K and Na within the particle. Therefore, this derivation involved the solution of a two-dimensional radial diffusion problem in which K diffuses from a receding weathering front to the periphery of the particle.

The validity of these assumptions and the resulting expression was evaluated with experimentally determined K release data. The experimental data were obtained with different size fractions of biotite and muscovite placed in NaCl-NaTPB solutions for different periods of time. The results obtained with each size fraction were accurately described by the theoretical expression. In the case of a 50 to 62µ biotite fraction, this was true even though 90% of the K was released in a period of 113 hours. On the other hand, the expression did not account for the effect of particle size. A modification of the expression, based on the experimental results, however, accounted for the effects of both time and particle size.

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Abstract: Time course and the processes in the sorption of cesium from dilute solutions by illite, montmorillonite and vermiculite saturated with Ca or K and in the absence of excess saturating cation were investigated.

Cesium sorbed by illite and montmorillonite quickly reached an approximate equilibrium; the Cs sorbed by montmorillonite did not change with time while the Cs sorbed by illite changed only slightly. On the other hand, the Cs sorbed by vermiculite did not reach an equilibrium even after 500 hr. Cesium sorbed by Ca-vermiculite continued to increase while the Cs sorbed by K-vermiculite decreased.

Since the sorption of Cs by illite is limited to the external planar surfaces and interlattice edges only, equilibrium is quickly reached. Equilibrium in montmorillonite is attributed to its expanded lattice which makes all exchange sites equally available and permits exchange readily. The increased Cs sorption by Ca-vermiculite, on the other hand, is attributed to the different sorption rates by different exchange sites: initial fast sorption on external surfaces and edges followed by slow diffusion into the interlayers. The decreased Cs sorption by K-vermiculite is perhaps associated with the collapse of the partially hydrated vermiculite in suspension to 10A.

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Abstract: Strong retention of cations, commonly referred to as fixation, was studied using Cs and Sr exchange reactions with Montana vermiculite. Fixation was defined as the property of an exchanger to retain cations in a state such that they are not available for rapid isotopic exchange in a well-stirred system. Efforts were directed toward qualitatively determining some of the conditions under which fixation occurs.

Equations were derived to calculate fixation using isotopic equilibrium values attained with separate aliquots of carrier-free isotope. Cesium fixation occurred in all size fractions of vermiculite ranging from 40–20 mesh through < 0.2 µ upon addition of 1 symmetry stable CsCl. The amount of 134Cs fixed at this Cs level depended on the sequence of adding separate aliquots of isotope and the corresponding stable salt, and appeared to be caused by lattice collapse.

The amount of Cs fixed increased with increasing additions of CsCl. However, when Cs saturation of the vermiculite exchange capacity exceeded 4.5%, the fraction of sorbed Cs that became fixed was relatively constant. A plot of Cs fixation vs. percent Cs saturation of the exchange capacity indicated that fixation was independent of time over an interval of 4 months.

In contrast to the Cs results, Sr was always readily exchangeable, with no evidence of lattice collapse.

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Full Text: [1960-80\Soi Sci Soc Ame Pro32, 364.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro32,%20364.pdf)

Abstract: Boron retention by hydroxy iron and aluminum materials was found to be pH dependent with maximum retention occurring in the alkaline range. The hydroxy aluminum materials retained B in amounts that were an order of magnitude greater than the amounts retained by the hydroxy iron materials. Boron retention by these materials was significantly reduced by aging on a steam bath prior to being treated with B.

Iron and aluminum were precipitated from solutions in the presence of B in application of the “mole ratio” method of determining the formulas of complexes. Evidence was obtained indicating Fe(III) or Al(III) and B were precipitated in stoichiometric proportions. Considering these precipitated forms as “solid complexes” with the general formula, MXn, a greater variety of complexes was found in the Al(III) systems than in the Fe(III) systems. In the Fe(III)-B systems, values of n for the most part were ≤1.0; in the Al(III)-B systems, values of n were ≥1.0.

Samples of similar constitution to those used in the “mole ratio” study were prepared for each metal at three pH levels. The amount of B combined in the precipitate was determined as a function of aging. The amount of B combined in the precipitate of the pH 6 samples remained relatively unchanged throughout the course of the 42-day aging period whereas the amount of B combined in the pH 9, 10, and 11 samples decreased with time. Since the observed decreases in the amounts of B combined in the precipitates were limited to the pH 9, 10, and 11 samples, it was concluded that the ready source of hydroxyl ion in these suspensions promoted hydrolysis of the hydroxy iron and aluminum precipitates, resulting in expulsion of B from the precipitates probably as borate ions.

? Hanawalt, R.B. (1969), Environmental factors influencing sorption of atmospheric ammonia by soils. *Soil Science Society of America Proceedings*, **33** (2), 231-234.

Full Text: [1960-80\Soi Sci Soc Ame Pro33, 231.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro33,%20231.pdf)

Abstract: Under conditions of controlled temperature and atmospheric ammonia concentration, the sorption rate for atmospheric ammonia by six soils from New Jersey decreased only slightly over exposure periods up to 4 days and averaged 55 to 74 kg of NH3-N/ha/year. The ammonia sorption rate for these soils increased rapidly with increasing ammonia concentration and moderately with increasing temperature. Calculated energies of activation suggest that sorbed ammonia is held by chemical bonds rather than by physical adsorption. Increasing the velocity of gas flow across the soil surface brings more ammonia into contact with the soil and thus enhances the sorption rate. Soils sorb significant amounts of ammonia from the atmosphere which under some environmental conditions may constitute a major mechanism in the transfer of nitrogen form the atmosphere to soils.

? Malcom, R.L. and Kennedy, V.C. (1969), Rate of cation exchange on clay minerals as determined by specificion electrode techniques. *Soil Science Society of America Proceedings*, **33** (2), 247-253.

Full Text: [1960-80\Soi Sci Soc Ame Pro33, 247.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro33,%20247.pdf)

Abstract: A cationic electrode (used as a potassium specific-ion electrode and a sodium specific-ion electrode were used to measure rates of cation exchange on clay minerals. The Ba-K exchange rates for kaolinite, illite, and montmorillonite were rapid with >75% exchange being measured within 3 sec. Because this time interval represents response time of the specific-ion electrode, the Ba-K exchange on these clay minerals occurs at a faster rate than this and may be an instantaneous process. Ba-K exchange on vermiculitic materials was characterized by both a rapid and a slow rate of exchange. A major part of the Ba-K exchange in silt- and clay-size vermiculite was found to be diffusion controlled.

Ca-K, Mg-K, Ca-Na, and Mg-Na exchange rates were rapid for all vermiculites and other clay minerals used in the experiment. Only Poole vermiculite exhibited two rates of Ba-Na exchange similar to those shown by all vermiculites during Ba-K exchange. Ba-Na exchange rates on all vermiculites except Poole were rapid.

? Green, R.E. and Yamane, V.K. (1970), Precision in pesticide adsorption measurements. *Soil Science Society of America Proceedings*, **34** (2), 353-355.

Full Text: [1960-80\Soi Sci Soc Ame Pro34, 353.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro34,%20353.pdf)

Abstract: The precision of solute adsorption measurements (based on change of concentration in a solution equilibrated with an adsorbent) depends upon the magnitude of the solution concentration change. Coefficients of variation for measurements of atrazine adsorption on soil were inversely related to the amount adsorbed. Such variation in precision is the consequence of the indirect method of determination rather than variable experimental technique. Unsatisfactory precision is common in adsorption measurements; improvement can sometimes be achieved by altering the soil:solution ratio to obtain larger concentration changes.

Keywords: Adsorption

? Rhoades, J.D., Ingvalson, R.D. and Hatcher, J.L. (1970), Adsorption of boron by ferromagnesian minerals and magnesium hydroxide. *Soil Science Society of America Proceedings*, **34** (6), 938-941.

Full Text: [1960-80\Soi Sci Soc Ame Pro34, 938.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro34,%20938.pdf)

Abstract: Arid-zone soils are found to have appreciable boron-sorption capacities in their silt and sand fractions. The site of this sorption is hypothesized to be magnesium-hydroxy clusters and coatings that exist on the weathering surfaces of ferromagnesian minerals such as olivine, enstatite, diopside, augite, tremolite, and hornblende as well as micaceous layer-silicate minerals.

? Green, R.E. and Corey, J.C. (1971), Pesticide adsorption measurement by flow equilibration and subsequent displacement. *Soil Science Society of America Proceedings*, **35** (4), 561-565.

Full Text: [1960-80\Soi Sci Soc Ame Pro35, 561.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro35,%20561.pdf)

Abstract: Adsorption of pesticides from solution was measured by continuous-flow equilibration and subsequent displacement from the soil by organic solvents. This new method and the conventional batch-equilibration method gave similar results for adsorption of diuron and atrazine on three surface soils. The flow method gave superior precision to the batch method on the subsoils studied. The new procedure is well adapted to studies of adsorption reversibility and also has the advantage of limited destruction of soil aggregates during equilibration.

Keywords: Adsorption

? Leenheer, J.A. and Ahlrichs, J.L. (1971), Kinetic and equilibrium study of adsorption of carbaryl and parathion upon soil organic matter surfaces. *Soil Science Society of America Proceedings*, **35** (5), 700-705.

Full Text: [1960-80\Soi Sci Soc Ame Pro35, 700.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro35,%20700.pdf)

Abstract: Insight into the mechanisms of carbaryl (1-Napthyl-IV-methyl carbamate) and parathion (O, O-Diethyl-o-p-nitrophenylphosphorothioate) adsorption upon organic matter derived from the Romney silty clay loam, Zanesville silt loam, and Carlisle muck soils was obtained by twofold kinetic and equilibrium study of adsorption in nonflow aqueous systems. The differences in adsorptive characteristics of the various types of organic matter were small in both the kinetic and equilibrium studies, but changing the saturating cation from calcium to hydrogen greatly increased the adsorptive capacities for both insecticides. The magnitude of the adsorptive capacities was explained in terms of the magnitude of the hydrophobic natures of the insecticide adsorbates and the organic matter adsorbents.

Kinetic adsorption studies conducted at 5, 25, and 40C showed the rate to increase as the temperature increased with the magnitude of the initial rate constant being 10~4 sec -1 • The rate-limiting step was interpreted to be diffusion of the insecticide solute molecules to the surface of the adsorbent for the first 10 min of adsorption. At longer times, intraparticle diffusion of the adsorbate into the interior of the adsorbent particles was rate limiting.

? Li, W.C., Armstrong, D.E., Williams, J.D.H., Harris, R.F. and Syers, J.K. (1972), Rate and extent of inorganic phosphate exchange in lake sediments. *Soil Science Society of America Proceedings*, **36** (2), 279-285.

Full Text: [1960-80\Soi Sci Soc Ame Pro36, 279.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro36,%20279.pdf)

Abstract: The exchangeability of sediment inorganic P was investigated by adding carrier-free 32P inorganic phosphate to steady-state lake sediment-water systems and measuring the rate and extent of 32P incorporation into the sediment phase. The effects of sediment properties (calcareous and noncalcareous), oxygen status, and addition of inorganic P on exchangeability were evaluated. Exchangeable P comprised from 19 to 43% of the total native inorganic P of the sediments investigated. Although inorganic P was released into solution in anaerobic systems due to reduction of iron from the ferric to the ferrous state, the total pool of exchangeable P (sediment phase plus in solution) was not greatly altered. Sorbed added inorganic P (equilibrated 2 weeks) showed approximately the same degree of exchangeability as native inorganic P in noncalcareous sediments but was more exchangeable in calcareous sediments. Exchangeable P exhibited exchange rates which were resolved into three separate first-order reactions by a graphical procedure. A major portion of exchangeable native sediment P (45 to 87%) participated in the rapid exchange reaction characterized by an exchange rate constant ranging from 7.4 to 46 hours-1. These results show that a large pool of sediment inorganic P has a high potential for interaction with the overlying lake water and for biological assimilation

Notes: highly cited

? Kuo, S. and Lotse, E.G. (1972), Kinetics of phosphate adsorption by calcium carbonate and Ca-kaolinite. *Soil Science Society of America Proceedings*, **36** (5), 725-729.

Full Text: [1960-80\Soi Sci Soc Ame Pro36, 725.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro36,%20725.pdf)

Abstract: The objective of the present investigation was to elucidate the time-dependence of phosphate adsorption by calcium carbonate and Ca-kaolinite and to suggest a mechanism of adsorption. The phosphate adsorption by calcium carbonate and Ca-kaolinite at low phosphate concentrations in solution could be described by Langmuir adsorption isotherms, indicating that a monolayer of phosphate is formed on the surface. The calculated maximum surface saturation was 25µg/g for calcium carbonate and 187µg/g for Ca-kaolinite. A second-order kinetic equation was developed which considers both the change in phosphate concentration in solution and the surface saturation of the adsorbent during the adsorption process. The rate constant of phosphate adsorption was about 30,000 times greater for calcium carbonate than for Ca-kaolinite. About 80% of the phosphate adsorption by calcium carbonate was completed within 10 sec. The variation of the second-order rate constant with phosphate concentration was different in the two systems. The rate constant decreased in the calcium carbonate-phosphate system and increased in the Ca-kaolinite-phosphate system with increasing phosphate concentration. It was suggested that phosphate ions are adsorbed by displacing coordinated water molecules and/or coordinated anions.

? Syers, J.K., Browman, M.G., Smillie, G.W. and Corey, R.B., (1973), Phosphate sorption by soils evaluated by the Langmuir adsorption equation. *Soil Science Society of America Proceedings*, **37** (3), 358-363.

Full Text: [1960-80\Soi Sci Soc Ame Pro37, 358.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro37,%20358.pdf)

Abstract: The sorption of added inorganic phosphate (P) by three soils which varied appreciably in their ability to sorb P was evaluated using the Langmuir adsorption equation. When the sorption data were plotted according to the conventional Langmuir equation, two linear relationships were obtained, indicating the presence of two populations of sites which have a widely differing affinity for P. Previous workers have obtained a single linear Langmuir relationship over the same equilibrium P concentration range (up to 14 µg/ml). The sites in part I (straight line corresponding to lower equilibrium P concentrations) had a very much higher (between 33 and 91 times) binding energy constant (K1), determined by regression analysis, than those in part II (straight line corresponding to higher equilibrium P concentrations). Between 40 and 52% of the total adsorption maxima was sorbed by sites in part I. A plot of the sorption data according to a rearranged form (Eadie-Hofstee plot) of the Langmuir equation gave a curve which could not be resolved satisfactorily into two straight-line components, suggesting the existence of three populations of sites. The rearranged form of the Langmuir equation was found to be preferable for evaluating P sorption at low equilibrium P concentrations. Predictions, based on the addition of high levels of added P, of the interrelationships between sorbed P and equilibrium P concentrations typical of the soil solution and soil-water systems, such as runoff, may be in error because of the failure to consider the existence of sites with appreciably higher K1 values than those which sustain relatively high concentrations of inorganic P in solution.

Keywords: Soils, Adsorption, Phosphates

? Hornsby, A.G. and Davidson, J.M. (1973), Solution and adsorbed fluometuron concentration distribution in a water-saturated soil: Experimental and predicted evaluation. *Soil Science Society of America Proceedings*, **37** (6), 823-828.

Full Text: [1960-80\Soi Sci Soc Ame Pro37, 823.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro37,%20823.pdf)

Abstract: A technique is described for measuring the solution and adsorbed phases of fluometeron in water-saturated soil columns. The data reveal that at an average pore-water velocity of 5.5 cm/hour, the solution and adsorbed phases of fluometuron are not in equilibrium, whereas, at the 0.59 cm/hour velocity they were in equilibrium. The kinetic rate equations for adsorption and desorption were not significantly better than the equilibrium model when describing the fast displacement of fluometuron through soils. The desorption distribution coefficient (θkA’/ρkD’) was found to be a function of the maximum amount of herbicide adsorbed prior to desorption. The experimental data were reasonably well described by the mathematical model.

Biggar, J.W. and Cheung, M.W. (1973), Adsorption of picloram (4-amino-3,5,6-trichloropicolinic acid) on panoche, ephrata, and palouse soils: A thermodynamic approach to the adsorption mechanism. *Soil Science Society of America Proceedings*, **37** (6), 863-868.

Full Text: [S\Soi Sci Soc Ame Pro37, 863.pdf](S/Soi%20Sci%20Soc%20Ame%20Pro37,%20863.pdf); [1960-80\Soi Sci Soc Ame Pro37, 863.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro37,%20863.pdf)

Absract: The adsorption of picloram (4-amino-3,5,6-trichloropicolinic acid) was studied on Panoche clay loam (at pH 4.2 and 1.2), Ephrata sandy loam, and Palouse silty loam. The adsorption processes could be described by the Freundlich equation with Freundlich constants, K, 1/n, and percentage of adsorption at 25C: respectively, 0.210, 0.92, and 3–5.6% for Panoche at pH 4.2; 2.5, 0.93, and 30% for Panoche at pH 1.2; 0.172, 0.99, and 1.9–3.6% for Ephrata; and 1.74, 0.92, and 26–33% for Palouse. Also evaluated were the standard free energy, entropy, and enthalpy associated with the adsorption processes. The values of ΔG° (kcal/mol), ΔS° (cal/mol per degree), and ΔH° (kcal/mol) were: respectively, −1.2±0.1, −14±2, and −5.3±0.6 for Panoche at pH 4.2; −2.98±0.05, −59±2, and −20±1 for Panoche at pH 1.2; −1.80±0.06, −24±3, and −9±1 for Ephrata; and −3.11±0.05, −3.3±1.5, and −4.1±0.4 for Palouse. Thermodynamic parameters were useful in assigning adsorption mechanisms to the four picloram-adsorbent-water systems.

Griffin, R.A. and Jurinak, J.J. (1973), Test of a new model for the kinetics of adsorption-desorption processes. *Soil Science Society of America Proceedings*, **37** (6), 869-872.

Full Text: [1960-80\Soi Sci Soc Ame Pro37, 869.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro37,%20869.pdf)

Absract: A new model for the kinetics of adsorption-desorption processes proposed by Lindstrom, Haque, and Coshow (1970) was tested with adsorption and desorption data for the interaction of phosphate with the calcite mineral surface. The model was found to offer considerable advantages in speed and convenience to those users whose experimental conditions correspond to the assumptions inherent in the derivation of the model. There was reasonable agreement between the predicted adsorption kinetic parameters and experimental data. However, considerable disparity was observed between predicted and experimental desorption parameters. It was concluded that the model was not valid for endothermic processes.

? Kuo, S. and Loyse, E.G. (1974), Kinetics of the phosphate adsorption by lake sediments. *Soil Science Society of America Proceedings*, **38** (1), 50-54.

Full Text: [1960-80\Soi Sci Soc Ame Pro38, 50.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro38,%2050.pdf)

Abstract: The objectives of the present investigation were to gain information on the rate and extent of phosphate adsorption and desorption and the energy of phosphate adsorption by lake sediments, and to evaluate the influence of the sediments on the phosphorus status of lake waters. While phosphate adsorption by sediments from Sebasticook Lake, Maine, could be described by the Freundlich equation over a large phosphorus concentration range, the Langmuir equation provided a good fit to the experimental data only at low phosphorus concentrations. The deviation from the Langmuir isotherm at high phosphorus concentrations was explained by an increase in total negative potential of the surface due to phosphorus adsorption and increased interaction between adsorbate molecules. The rate of phosphorus adsorption by the sediments could be described by the equation X = KC0t1/m. The calculated activation energy was 2.7 kcal/mole.

The desorption of phosphorus from minerals and sediments was dependent on the anionic species present in the solution. The replacing power of the anions appeared to be related to their ionic potential and complexing ability. The rate of phosphorus desorption could be described by the proposed kinetic equation.

? Griffin, R.A. and Jurinak, J.J. (1974), Kinetics of the phosphate interaction with calcite. *Soil Science Society of America Proceedings*, **38** (1), 75-79.

Full Text: [1960-80\Soi Sci Soc Ame Pro38, 75.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro38,%2075.pdf)

Abstract: The kinetics of the phosphate interaction with calcite were studied. The results showed that the reaction did not proceed in the absence of the calcite surface. The kinetics of interaction could be described by two simultaneous reactions. The first reaction was second-order and was ascribed to the adsorption of phosphate on the calcite surface. The second reaction was first-order and was considered to be associated with the surface arrangement of phosphate clusters into calcium phosphate heteronuclei.

Solubility criteria were used to show that at low phosphate concentrations the ultimate calcium phosphate surface mineral formed was hydroxylapatite.

Desorption kinetics were studied by using an anion exchange resin technique. The desorption process could be described as two simultaneous first-order reactions. The desorption mechanism was postulated to correspond to the dissolution of a surface nucleated calcium phosphate mineral, with the second reaction step being the desorption of phosphate from the calcite surface sites.

The rate constants for adsorption and desorption were determined at four temperatures between 0C and 40C. The rate constants were used to compute the activation energies of adsorption and desorption. In addition, the thermodynamic parameters for the enthalpy of activation (ΔH†), the entropy of activation (ΔS†), and the free energy of activation (ΔG†), for both the adsorption and desorption processes were computed and discussed.

? Enfield, G.G. (1974), Rate of phosphorus sorption by five Oklahoma soils. *Soil Science Society of America Proceedings*, **38** (3), 404-407.

Full Text: [1960-80\Soi Sci Soc Ame Pro38, 404.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro38,%20404.pdf)

Abstract: Two equations are evaluated in relation to their suitability as rate equations for phosphorus sorption by selected Oklahoma soils. The rate equation which best fits experimental data was ∂S/∂t = aCbSc where S is the sorbed concentration [mass per unit weight of the soils], C is solution concentration [mass per unit weight of the solution], t is time and a, b, and c are constants.

Skopp, J. and Warrick, A.W. (1974), A two-phase model for the miscible displacement of reactive solutes in soil. *Soil Science Society of America Proceedings*, **38** (4), 545-550.

Full Text: [S\Soi Sci Soc Ame Pro38, 545.pdf](S/Soi%20Sci%20Soc%20Ame%20Pro38,%20545.pdf); [1960-80\Soi Sci Soc Ame Pro38, 545.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro38,%20545.pdf)

Abstract: Miscible displacement is studied by considering the flow regime to be composed of separate mobile and stationary phases. Solute transfer through the mobile phase occurs only by convection, whereas adsorption or reaction by the soil matrix is diffusion limited and occurs normal to the mobile-stationary interface. The model is unique in that a specific rate law is not assumed, but the solution is exact. Results are presented graphically as a function of two parameters which are compared with experimental results of other workers. The displacement of calcium by magnesium was more closely in agreement with theoretical predictions than was adsorption of picloram.

? Griffin, R.A. and Burau, R.G. (1974), Kinetics and equilibrium studies of boron desorption from soil. *Soil Science Society of America Proceedings*, **38** (6), 892-897.

Full Text: [1960-80\Soi Sci Soc Ame Pro38, 892.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro38,%20892.pdf)

Abstract: Kinetics of boron desorption from soil were determined using 0.05M mannitol solutions to create pseudo first-order reaction conditions. The results showed two separate pseudo first-order reactions and one very slow reaction for which detailed kinetic treatment was not attempted. The relative amount of boron associated with the two fast reactions was independent of soil texture and of initial sample boron content.

It was postulated that the two reaction rates were due to desorption from two independent boron retention sites. It was speculated that the two fast reactions were due to desorption from hydroxy iron, magnesium, and aluminum materials in the clay fraction. The third or slowest reaction rate was probably due to diffusion of boron from the interior of clay minerals to solution phase.

Equilibrium studies showed that boron desorption followed a 2-site analog of a linear form of the 1-site Langmuir expression. Langmuir adsorption maximum values for each site corroborated those calculated from the kinetic study and supported the multisite interpretation of the kinetic data.

? Stanford, G., Vanderpol, R.A. and Dzienia, S. (1975), Denitrification rates in relation to total and extractable soil carbon. *Soil Science Society of America Proceedings*, **39** (2), 284-289.

Full Text: [1960-80\Soi Sci Soc Ame Pro39, 284.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro39,%20284.pdf)

Abstract: Denitrification rates were studied under near-anaerobic conditions in 30 soils of diverse origin that differed widely in pH, organic C contents, and other characteristics. Soils with added NO3-N were submerged in water and containers were sealed to prevent further oxygen intake during incubation. Disappearance of NO3-N and production of NH4-N were determined at 1-day intervals or longer over a 10-day period. Since soils were not shaken during incubation, denitrification rates were influenced by diffusion of nitrate from the liquid to the soil layer. In most soils, amounts of NO3-N declined exponentially with time of incubation. Thus, under the experimental conditions, the loss of nitrate was depicted better by log NO3-N vs. time (t, hours) than ppm NO3-N vs. t. The apparent first-order rate constants (k), denoting the fractional loss of NO3-N/hour, ranged from about 0.001 to 0.04 hour-1. Correlations of k with total soil organic C and with soil “glucose-C,” extracted by boiling soils for 1 hour in 0.01M CaCl2, were highly significant. However, the extractable glucose-C (an index of readily decomposable C sources) provided a more reliable basis for predicting k than did total organic C. The regression of k on glucose C (X) for 30 soils is as follows: k = 0.188X − 0.00093, (r2 × 100 = 82%). For the corresponding regression involving total organic C, r2 × 100 = 69%. Within 24 to 48 hours, appreciable amounts of Mn appeared in solution and usually continued to increase with time. Reduced Fe did not appear until most of the NO3-N had disappeared. After 48 hours of incubation, the multiple regression of Mn (Y), in solution, on NH4-N produced (X1) and initial soil pH (X2), with associated statistics, was as follows: Y = 13.8 + 3.5X1 − 13.5X2 (R = 0.77), rY1.2 = 0.48. Values are significant at the 1% level.

? Kinniburg, D.G., Syers, J.K. and Jackson, M.L. (1975), Specific adsorption of trace amounts of calcium and strontium by hydroxides. *Soil Science Society of America Proceedings*, **39** (3), 464-470.

Full Text: [1960-80\Soi Sci Soc Ame Pro39, 464.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro39,%20464.pdf)

Abstract: Freshly prepared Fe and Al hydrous oxide gels and the amorphous product of heating gibbsite selectively adsorbed traces of Ca and Sr from solutions containing a large excess (∼1M) of NaNO3. The fraction of the added Ca (Sr) adsorbed depended principally on the suspension pH, the amount of solid present, and to a lesser extent on the NaNO3 concentration. Significant Ca and Sr adsorption occurred on the Fe and Al gels, and heated gibbsite, at pH values below the points of zero charge (8.1, 9.4, and 8.3±0.1, respectively), indicating specific adsorption. The pH (± 0.10) at which 50% of the Ca was adsorbed (pH50) occurred at pH 7.15 for the Fe gel (0.093M Fe), 8.35 for the Al gel (0.093M Al), and 6.70 for the heated gibbsite (0.181M Al); for Sr, the pH50 values were 7.10, 9.00, and 6.45, respectively. For the Fe gel and heated gibbsite, an empirical model based on the law of mass action described the pH dependence of adsorption reasonably well and suggested that for each Ca or Sr fraction adsorbed, approximately one proton was released. Failure of the Al gel to fit this model may have resulted from its rapid aging.

? Stanford, G., Dzienia, S. and Vanderpol, R.A. (1975), Effect of temperature on denitrification rates in soil. *Soil Science Society of America Proceedings*, **39** (5), 867-870.

Full Text: [1960-80\Soi Sci Soc Ame Pro39, 867.pdf](1960-80/Soi%20Sci%20Soc%20Ame%20Pro39,%20867.pdf)

Abstract: The effect of temperature on denitrification rate was studied with nine soils differing widely in organic matter content and chemical and physical characteristics. In the range of 15 to 35C, the temperature coefficient of denitrification, Q10, was approximately 2. Denitrification rates at 35 and 45C were similar. Between 10 and 5C, denitrification rate declined abruptly. The lower limit of the temperature range conforming to a Q10 of 2 was estimated to be 11C. In this study of water-logged soils sealed from the atmosphere, denitrification appeared to obey first-order kinetics.

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? Yu, D.Y., Bae, W., Kang, N.G., Banks, M.K. and Choi, C.H. (2005), Characterization of gaseous ozone decomposition in soil. *Soil & Sediment Contamination*, **14** (3), 231-247.

Full Text: [2005\Soi Sed Con14, 231.pdf](2005/Soi%20Sed%20Con14,%20231.pdf)

Abstract: Laboratory scale batch experiments were performed to investigate the decomposition characteristics of gaseous ozone in porous media. The decomposition rates of gaseous ozone in several solid media were determined, and the relationship of moisture content with sorbed ozone molecules was evaluated. Ozone decomposition in control and glass beads packed columns followed second-order reaction kinetics, while ozone consumption in a sand-packed column demonstrated first-order kinetics with a rate constant of 0.0109 min-1 and half-life of 1.0 h. The presence of typical metal oxides in the soil resulted in ozone consumption rates in the following order: hematite (Fe2O3) &GT, silica-alumina (SiO2Al2O3) &GT, alumina (Al2O3) &GT, silica (SiO2). Ozone decomposition was highly dependent upon soil moisture content. Over 90% of the total ozone mass decomposed in the field soil with moisture content at less than 1 wt%, whereas as low as 5-15% of the total ozone mass degraded with moisture content at more than 2 wt%. In conclusion, ozone decomposition in soils was primarily controlled not only by soil organic matter but also by reactive metal oxides on the soil surface. These two factors were shown to be highly dependent upon soil moisture content.

Keywords: Adsorption, Contamination, Decomposition, Metal Oxides, Ozone, Soil, Organic Vapors, Gas-Phase, Humidity, Sorption, Temperature, Adsorption, Ozonation, Mechanism, Catalyst

? Pakshirajan, K. and Swaminathan, T. (2006), Continuous biosoirption of Pb, Cu, and Cd by Phanerochaete chrysosporium in a packed column reactor. *Soil & Sediment Contamination*, **15** (2), 187-197.

Full Text: [2006\Soi Sed Con15, 187.pdf](2006/Soi%20Sed%20Con15,%20187.pdf)

Abstract: The dynamic removal of lead, copper and cadmium in a single component system by Phanerochaete chrysosporium was studied in packed columns. The packed columns consisted of biomass of P. chrysosporium immobilized on polyurethane foam cubes. The performances of packed columns were described through the concept of breakthrough and the values of column parameters predicted as a function of bed depth. The column biosorption data were evaluated in terms of maximum (equilibrium) capacity of the column, the amount of metal loading and the yield of the process. The maximum capacities for lead, copper and cadmium were 70.7, 43.7 and 70.8 mg, respectively, and their yields were 39.2, 40.6 and 41%, respectively. The kinetic and mass transfer aspects of the dynamic removal of the three metals were studied using three mathematical models commonly used to describe the column performance in adsorption processes. Column studies showed good agreement between the experimental data and the simulated breakthrough curves obtained with Adams-Bohart or the Wolborska model and the Clark model. While the initial segment of the breakthrough curve was defined by the Adams-Bohart and Wolborska models, the whole breakthrough curve was well predicted by the Clark model for all the three metals studied.

Keywords: Activated Carbon, Adsorption, Biomass, Biosorption, Biosorption, Breakthrough, Breakthrough Curve, Breakthrough Curves, Cadmium, Capacity, Cd, Column, Column Biosorption, Column Studies, Copper, Cu, Data, Depth, Dynamic, Dynamic Removal, Equilibrium, Experimental, Foam, Function, Heavy Metals, Immobilized, Ions, Kinetic, Lead, Loading, Mass, Mass Transfer, Mathematical Models, Metal, Metal Loading, Metals, Model, Models, P, Packed Column, Packed Column Reactor, Pb, Performance, Phanerochaete Chrysosporium, Polyurethane, Polyurethane Foam, Process, Removal, Simulated, Transfer, Values

? Rodriguez-Cruz, M.S., Sanchez-Martin, M.J., Andrades, M.S. and Sanchez-Camazano, M. (2006), Comparison of pesticide sorption by physicochemically modified soils with natural soils as a function of soil properties and pesticide hydrophobicity. *Soil & Sediment Contamination*, **15** (4), 401-415.

Full Text: [2006\Soi Sed Con15, 401.pdf](2006/Soi%20Sed%20Con15,%20401.pdf)

Abstract: The objectives of this paper were to determine the efficiency of physicochemically modified soils with a surfactant in the sorption of pesticides, the stability against washing of the pesticides sorbed, and the effective sorption capacity of surfactant adsorbed by soils as a function of pesticide hydrophobicity and soil characteristics. Five soils of different characteristics and five pesticides (penconazole, linuron, alachlor atrazine and metalaxyl) with different Kow values were selected and octadecyltrimethylammonium bromide (ODTMA) was chosen as model of cationic surfactants. Sorption-desorption isotherms were obtained and constants Kf and Kfd for natural soils (from Freundlich equation) and K and Kd for ODTMA-soils (from linear equation) were determined. Sorption on ODTMA-soils was higher than on natural soils. K increased 27-165 times for penconazole, 22-77 times for linuron, 7-14 times for alachlor 9-23 times for atrazine, and 21-333 times for metalaxyl in relation to Kf Sorption coefficients normalized to 100% of total organic matter (TOM) from organo soils K-OM (K 100/%TOM), were always higher than those from natural soils Kf(OM) (Kf 100/%OM), indicating that the organic matter (OM) derived from the ODTMA (OMODTMA) had a greater sorption capacity than the OM of the natural soil. K-OM values were also higher than the Kow (octanol/water distribution coefficient) value for each pesticide. The similarity of the high K-OM values for the sorption of each pesticide by the five soils and the linearity of isotherms point to a partitioning of the pesticides between surfactant and water The use in this work of different soils and various pesticides, unusual in this type of investigation, allowed us to obtain equations to know the sorbed amount of a given pesticide by the surfactant-modified soils as a function of the OM content derived from the cation and the Kow of the pesticide. The results obtained are of interest when it becomes necessary to increase the sorption capacity of soils with low OM contents with a view to delaying pesticide mobility in soils from pollution point sources (high concentration in small area), and preventing the pollution of waters.

Keywords: Adsorption, Atrazine, Capacity, Cationic Surfactant, Concentration, Degradation, Desorption, Desorption, Distribution, Distribution Coefficient, Efficiency, Freundlich, Herbicides, Hydrophobicity, Isotherms, Matter, Metalaxyl, Mobility, Model, Modified, Modified Soils, Natural, Organic, Organic Matter, Organic-Compounds, Organoclays, Paper, Partitioning, Penconazole, Pesticide, Pesticides, Pollution, Properties, Soil, Soil Properties, Soils, Sorbed, Sorption, Sorption Capacity, Sources, Stability, Surfactant, Surfactants, Vineyard Soils, Washing, Water, Water Pollution

? Adhami, E., Salmanpour, A., Omidi, A., Khosravi, N., Ghasemi-Fasaei, R. and Maftoun, M. (2008), Nickel adsorption characteristics of selected soils as related to some soil properties. *Soil & Sediment Contamination*, **17** (6), 643-653.

Full Text: [2008\Soi Sed Con17, 643.pdf](2008/Soi%20Sed%20Con17,%20643.pdf)

Abstract: There is little information on Nickel (Ni) adsorption by calcareous soils of Iran. The pattern of Ni retention and its relationships with soil properties in soils from the southern part of Iran (SSI) and northern part of Iran (SNI) was studied. Amount of Ni adsorption was calculated after the equilibration of 1 g soil samples in duplicate with 25 mL of 0.01 M CaCl2 solution containing 10 to 1000 mg Ni L-1. Freundlich, Langmuir, Temkin, Dubinin-Radushkevich, and Redlich-Peterson isotherms were fitted to Ni adsorption data. The fits to Langmuir, Freundlich, and Redlich-Peterson adsorption models were closer than other isotherms. The intercept of Freundlich equation (A(F)) and maximum buffering capacity of Langmuir (b(L)X(m)) was significantly correlated with clay in SSI whereas in SNI it was related to pH and organic matter (OM). Adsorption maxima (X-m) of Langmuir isotherm was correlated with cation exchange capacity (CEC) in both groups of soils. Variation of Redlich-Peterson constants (a(RP) and k(RP)) in SSI was due to combined effects of CEC, acid oxalate extractable Fe (Fe-o) and OM while they did not show significant relationship with soil properties in SNI. It appeared that clay, CEC, OM and pH are the main factors regulating Ni retention in the soils studied while calcium carbonate equivalent does not significantly affect Ni retention.

Keywords: Cation Exchange Capacity, pH, Organic Matter, Calcium Carbonate Equivalent, Calcareous Soils, Chemical Properties, Sorption, Retention, Isotherm, Copper, Lead, Iran, pH

# Title: Solid State Communications

Full Journal Title: [Solid State Communications](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5545&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=dbf7d51cb847129460268a1ffa428555)

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Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Physics, Condensed Matter: Impact Factor 1.671, / (2002)

Marx, W. and Cardona, M. (2003), The impact of *Solid State Communications* in view of the ISI Citation data. *Solid State Communications*, **127** (5), 323-336.

Full Text: [S\Sol Sta Com127, 323.pdf](S/Sol%20Sta%20Com127,%20323.pdf)

Abstract: Bibliometric techniques (i.e. citation analysis) are used to evaluate the impact and standing of *Solid State Communications* (SSC) among its competitor journals covering the field of condensed matter. In most cases, the analysis covers all issues dating back to the journal’s inception in 1963. In some cases, however, the analysis only covers articles published after 1973 because of limited access to the previous data under the available search system. A listing of the most cited articles appeared in SSC since its inception is given. Several of them include Nobel laureates among their authors. An analysis of the articles which remained uncited is also presented. Bibliometric data from the Institute for Scientific Information (ISI) such as the Journal Impact Factor (JIF), the Citing Half-Life as well as the Cited Half-Life are compared with those for other journals covering condensed matter and related fields. Furthermore, an analysis of the impact according to the countries of origin of authors is presented. A discussion of the results exhibited in Tables and Figures is given.

Keywords: Bibliometric Analysis, Citations, Journal Impact

# Title: Solid State Ionics

Full Journal Title: [Solid State Ionics](http://www.sciencedirect.com/science/journal/01672738)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher: Elsevier Science BV, Amsterdam

Publisher Address:

Subject Categories:

: Impact Factor

? Kotov, V.Y., Stenina, I.A. and Yaroslavtsev, A.B. (1999), Kinetics of hydrogen-sodium ion exchange in acid zirconium phosphate. *Solid State Ionics*, **125** (1-4), 55-60.

Full Text: [1999\Sol Sta Ion125, 55.pdf](1999/Sol%20Sta%20Ion125,%2055.pdf)

Abstract: Proton diffusion in NaHZr(PO4)2-5H2O and Na2Zr(PO4)2-3H2O phases was examined by studying the kinetics of hydrogen-sodium ion exchange. Three regions characterized by an almost linear dependence of the apparent diffusion coefficients of the hydrogen ion on the pH values were obtained at pH < 7, 7 < pH < 9 and 9 < pH < 11. The phenomenon was explained by different mechanisms of defect formation in the pH ranges investigated. The distribution of the proton defect concentration in the grains was estimated for different pH values, The influence of the anion nature in the contacting solutions on the diffusion coefficients was also discussed. The rate of ion exchange increases in the series: I- < Br- < Cl-, ClO4- <NO3- <SO42-. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Cation Mobility, Ion Exchange, Acid Phosphate, Double Phosphates, Diffusion

? El-Naggar, I.M., Zakaria, E.S., Shady, S.A. and Aly, H.F. (1999), Diffusion mechanism and ion exchange equilibria of some heavy metal ions on cerium(IV) antimonate as cation exchanger. *Solid State Ionics*, **122** (1-4), 65-70.

Full Text: [1999\Sol Sta Ion122, 65.pdf](1999/Sol%20Sta%20Ion122,%2065.pdf)

Abstract: The kinetics and mechanism of diffusion of Zn2+, Sr2+, Co2+ and Eu3+ in the H+-form of cerium(IV) antimonate (CeSb) have been studied as a function of particle sizes, reaction temperatures and solution concentrations of the exchanging ions. The exchange rate was controlled by particle diffusion mechanism as a limited batch technique. The physical thermodynamic parameters such as, activation energies and entropies of activation have been evaluated. The mobility of these ions inside the particles of the exchanger decrease in the order:

Zn2+ > Sr2+ > Co2+ > Eu3+

Keywords: Tin(IV) Antimonate, Kinetics

? Stenina, I.A., Aliev, A.D., Glukhov, I.V., Spiridonov, F.M. and Yaroslavtsev, A.B. (2003), Cation mobility and ion exchange in acid tin phosphate. *Solid State Ionics*, **162** (S), 191-195.

Full Text: [2003\Sol Sta Ion162, 191.pdf](2003/Sol%20Sta%20Ion162,%20191.pdf)

Abstract: Thermodynamics and kinetics investigation of ion exchange H+/M+ (M = Li, Na) in tin acid phosphate has been carried out. The equilibrium constants and the cation diffusion coefficients in the exchange products have been determined. It was shown that the diffusion coefficient value in MxH2 - xSn(PO4)2.nH2O depends strongly on proton concentration in the solution. The cation mobility in tin acid phosphate and its ion exchange products has been investigated by impedance spectroscopy too. It was shown that the ion conductivity of these compounds is determined by the surface contribution and increases with increase in the hydration degree. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Cation Mobility, Ion Exchange, Acid Tin Phosphate

# Title: Solid State Nuclear Magnetic Resonance

Full Journal Title: [Solid State Nuclear Magnetic Resonance](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5285&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=41019db60a434e75b7a53eac1385822e)

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Issues/Year:

Journal Country

Language:

Publisher: Elsevier Science BV, Amsterdam

Publisher Address:

Subject Categories:

: Impact Factor 0.788, 51/121

Hu, K.N. and Hwang, L.P. (1998), The influence of adsorbed molecules on Na-sites in NaY zeolite investigated by triple-quantum 23Na MAS NMR spectroscopy. *Solid State Nuclear Magnetic Resonance*, **12** (4), 211-220.

Full Text: [S\Sol Sta Nuc Mag Res12, 211.pdf](S/Sol%20Sta%20Nuc%20Mag%20Res12,%20211.pdf)

Abstract: The effect of hydration and benzene adsorption on Na-23 resonance and the quadrupolar interaction in NaY zeolites is studied by triple-quantum MAS Na-23 NMR spectroscopy. In the case of a C6D6/NaY system, the results show that with an increase in benzene loading, there is an up-field trend in isotropic chemical shift (delta(CS)) and a decreasing second order quadrupolar effect (chi(s)) for the site II sodium ions. It was found that adsorbed benzene molecules have a slight effect on the environment of sodium ions on site I. All the sodium sites in NaY are influenced upon hydration. The up-field shift of the sodium delta(CS) reflects the effect of coordination of oxygen atoms on sodium cations due to hydration. The magnitude of chi(s) for hydrated sodium sites increases and then falls off with water loading. The increase in chi(s) is due to the initial hydration among SI-, SI’- and SII-sodium ions, while the decrease is the result of approaching the final stage of saturated hydration. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: Benzene Adsorption In Nay, Hydrated NAY, MQMAS NMR, Isotropic Chemical Shift, Second Order Quadrupolar Effect, Powder Neutron-Diffraction, Y Zeolites, Benzene Adsorption, Sodium-Cations, Al-27, Location, Temperature, Resolution, Faujasites

# Title: Solvent Extraction and Ion Exchange

Full Journal Title: [Solvent Extraction and Ion Exchange](http://weblinks2.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+aphjnh+bt+TD++%222E3%22+F9EB&_ug=sid+8EAC6A51%2DD2B6%2D4FAE%2D9110%2D6408180E1796%40sessionmgr2+dbs+aph+E7B4&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%222E3%22+tg%5B0+%2D+db%5B0+%2Daph+op%5B0+%2D+h)

ISO Abbreviated Title: Solvent Extr. Ion Exch.

JCR Abbreviated Title: Solvent Extr Ion Exch

ISSN: 0736-6299

Issues/Year: 6

Journal Country United States

Language: English

Publisher: Marcel Dekker Inc

Publisher Address: 270 Madison Ave, New York, NY 10016

Subject Categories:

Chemistry: Impact Factor 0.788, 51/121

Ansted, J.P. and MacCarthy, P. (1984), Removal of heavy metal ions from solution by chemically modified peat: Effects of pH, ionic strength and flow rate. *Solvent Extraction and Ion Exchange*, **2**, 1105-1122.

Smith, C.M., Navratil, J.D. and MacCarthy, P. (1984), Removal of actinides from radioactive wastewaters by chemically modified peat. *Solvent Extraction and Ion Exchange*, **2** (7-8), 1123-1149.

Aparicio, J., Valiente, M. and Muhammed, M. (1985), Extraction kinetics of hydrochloric-acid by trilaurylamine at different ionic strengths. *Solvent Extraction and Ion Exchange*, **3** (4), 485-499.

? Berrueta, J., Freije, J.M., Adrio, G. and Coca, J. (1990), Synergistic effect in the extraction of phenol from aqueous-solutions with mixtures of n-butylacetate and acetophenone. *Solvent Extraction and Ion Exchange*, **8** (6), 817-825.

Abstract: Equilibrium data are reported for the extraction of phenol at 288, 293 and 298 K with n-butyl acetate (NBA), acetophenone (AP) and mixtures of NBA + AP and methyl isobutyl ketone (MIK) + AP. A synergistic behaviour is observed for the system phenol-water-(NBA/AP). Several equations have been used to correlate the experimental data: van’t Hoff, Redlich-Kister and other polynomial equations. Reported data were compared with those available in the literature.

? Cortina, J.L. and Miralles, N. (1997), Kinetic studies on heavy metal ions removal by impregnated resins containing di-(2,4,4-trimethylpentyl) phosphinic acid. *Solvent Extraction and Ion Exchange*, **15** (6), 1067-1083.

Full Text: [1997\Sol Ext Ion Exc16, 1067.pdf](1997/Sol%20Ext%20Ion%20Exc16,%201067.pdf)

Abstract: Kinetics measurements on the extraction of divalent metal ions (Zn, Cu and Cd) with impregnated resins prepared by adsorption of di(2, 4, 4-trimethylpentyl)phosphinic acid (DTMPPA=HL) onto a macroporous polymeric support of Amberlite XAD2 were made. The extraction process is accompanied by fast chemical reaction and is characterized by a sharp moving boundary between the reacted shell and the shrinking unreacted core within the impregnated resin. Analyses of the respective rate data in accordance with two theoretical models used to explain the metal extraction kinetics showed that process is controlled by the rate of diffusion of the ions penetrating the reacted layer at high metal ion concentration (1×10-2 mol.L-1) and controlled by the rate of diffusion of the ions across the liquid film surrounding the resin particle at low metal ion concentration (1×10-4 mol.L-1). Particle diffusion coefficients and mass transfer constants across the liquid film were determined from the graphical representation of the proposed models.

Keywords: Distribution Equilibria, Solvent-Extraction, Phosphoric-Acid, Separation, Cu(II), Exchange, Zn(II), Cd(II)

Abbasi, W.A. and Streat, M. (1998), Sorption of uranium from nitric acid solution using TBP-impregnated activated carbons. *Solvent Extraction and Ion Exchange*, **16** (5), 1303-1320.

Full Text: [1998\Sol Ext Ion Exc16, 1303.pdf](1998/Sol%20Ext%20Ion%20Exc16,%201303.pdf)

Abstract: The concept of extraction chromatography has been used to study the sorption of uranium from nitric acid solutions using tri-n-butyl phosphate (TBP) impregnated activated carbons. Batch equilibrium data and kinetic and breakthrough column behaviour of uranium are reported. Wood based activated carbon has shown better capacity and breakthrough characteristics than shell based activated carbon. Sorption rate on impregnated carbons was relatively slow indicating that diffusion is the rate controlling step within the pore structure of the activated carbon. Uranium distribution on impregnated activated carbons is compared with equivalent bulk liquid extraction and a mechansim of uranium sorption is discussed.

Keywords: Extraction Chromatography, Phosphate, Recovery, Waste

Bouvier, C., Cote, G., Cierpiszewski, R. and Szymanowski, J. (1998), Influence of salting-out effects, temperature and the chemical structure of the extractant on the rate of copper(II) extraction from chloride media with dialkyl pyridine dicarboxylates. *Solvent Extraction and Ion Exchange*, **16** (6), 1465-1492.

Full Text: [1998\Sol Ext Ion Exc16, 1465.pdf](1998/Sol%20Ext%20Ion%20Exc16,%201465.pdf)

Abstract: The kinetics of copper(II) extraction from chloride solutions with ACORGA CLX-50 and three model dipentyl pyridine dicarboxylates having ester groups at various positions in the pyridine ring is investigated. It is shown that the extraction occurs in a diffusional regime and that both the ionic strength and temperature have a strong effect on the rate of copper extraction. Basically, the initial rate of copper extraction (denoted hereafter J(o)) increases as the ionic strength is increased, whereas J(o) increases or decreases versus temperature depending on the ionic strength. Such phenomena are explained in terms of salting-out effects and diffusion properties. Furthermore, ACORGA CLX-50 is shown to exhibit a good kinetic performance compared to the three model dipentyl pyridine dicarboxylates.

Keywords: Di(2-Ethylhexyl)Phosphoric Acid, Iron(III), Kinetics, Esters

? Petruzzelli, D., Pagano, M., Tiravanti, G. and Passino, R. (1999), Lead removal and recovery from battery wastewaters by natural zeolite clinoptilolite. *Solvent Extraction and Ion Exchange*, **17** (3), 677-694.

Full Text: [1999\Sol Ext Ion Exc17, 677.pdf](1999/Sol%20Ext%20Ion%20Exc17,%20677.pdf)

Abstract: Technical feasibility of an ion exchange process for removal and recovery of lead present in battery manufacturing wastewaters is demonstrated. In absence of aluminium and ferric species, lead is quantitatively removed and recovered (approximate to 90%) from the neutralised wastewaters after elution on the natural zeolite clinoptilolite. Control of pH to 5.5-6 is necessary to minimise degradation of the exchanger material. Throughput volumes exceeding 2, 700 bed volumes (BV) (flowrate: F-exh= 10 BV/h) is obtained, when the initial Pb concentration is 4 mg/L, with the metal leakage steadily below the maximum allowable concentration (MAC<0.2 mgPb/L) set by the EU for discharge in rivers, lakes, coastal seawater. Regeneration of the zeolite is carried out by controlled elution of limited amounts of 1M NaCl, pH 4.5 (40BV, F-reg=5 BV/h) to minimize in situ precipitation of metals and preserve the zeolite from degradation. From spent regeneration eluate lead is recovered to the battery manufacturing operations. This latter operation is carried-out by precipitation in the form of hydroxycerussite (basic lead carbonate) or electrolysis as pure metal. In this way it is minimized the environmental impact after waste disposal (no hazardous waste formation) and, at the same time, it is recovered raw materials to the productive lines of origin (environmental protection and resource conservation). The exhausted mother liquors from lead precipitation operation is recycled to the subsequent zeolite regeneration step, after back-up of the initial regenerant concentration and solution pH.

Keywords: Ion-Exchange, Heavy-Metals, Sludge, Water

Saha, B., Iglesias, M., Cumming, I.W. and Streat, M. (2000), Sorption of trace heavy metals by thiol containing chelating resins. *Solvent Extraction and Ion Exchange*, **18** (1), 133-167.

Full Text: [2000\Sol Ext Ion Exc18, 133.pdf](2000/Sol%20Ext%20Ion%20Exc18,%20133.pdf)

Abstract: The sorption of copper, cadmium, nickel and zinc ions on thiol (-SH) based chelating polymeric resins (thiomethyl resin and Duolite GT-73) has been investigated. The physical and chemical characterisation of these polymers in the form of scanning electron micrographs (SEM), BET and Langmuir surface area measurements, Fourier transform infra red spectroscopy (FTIR) analysis, X-ray photoelectron spectroscopy (XPS) analysis, atomic composition measurement, sodium capacity determination and zeta potential measurements have been conducted to assess their performance as sorbents for trace toxic metal removal. Density functional theory (DFT) has been used to analyse the pore size distribution data. The adsorption of metal ions from aqueous solution on these sorbents has been studied in batch equilibrium experiments. The influence of pH on metal adsorption capacity has also been examined. The kinetic performance of these polymers has been assessed and the results have been analysed by a pore diffusion model. The resins have been used in mini-columns to study the selectivity towards the desired metal ion. The desorption of metal ions has been studied using hydrochloric acid (1 M and 4 M), sulphuric acid (1 M and 4 M) and acidified thiourea. The present study confirms that these thiol based chelating resins are very effective for selective removal of trace heavy metals from Water.

Keywords: Ion-Exchange Resin, Phosphoric-Acid Solutions, Dilute Aqueous-Solutions, Copper, Adsorption, Separation, Removal, Recovery, Polymers

? Mendoza, R.N., Medina, T.I.S., Vera, A., Rodriguez, M.A. and Guibal, E. (2000), Study of the sorption of Cr(III) with XAD-2 resin impregnated with di-(2,4,4-trimethylpentyl)phosphinic acid (Cyanex 272). *Solvent Extraction and Ion Exchange*, **18** (2), 319-343.

Full Text: [2000\Sol Ext Ion Exc18, 319.pdf](2000/Sol%20Ext%20Ion%20Exc18,%20319.pdf)

Abstract: Solvent impregnated resin containing Cyanex 272 (di-(2,4,4- trimethylpentyl)phosphinic acid, denoted HL) was prepared by adsorption of the organophosphorus extractant into the polymeric macroporous support Amberlite XAD-2. The extraction of Cr(III) from nitrate solution at 0.1 ionic strength by the impregnated resin has been studied at 25°C. The sorption of the metal ion was studied as a function of both pH and extractant concentration in the resin phase. The impregnated resin shows good affinity towards the extraction of Cr(III). The best sorption efficiency (98%) was obtained at pH approximate to 5. A thermodynamic model is proposed for modeling the distribution data. This model shows that Cr(III) is extracted as Cr(OH)(HL)2(NO3)2 and Cr(OH)L-2. The elution of the metal from the resin was accomplished (95%) with 6.0 M HCl. The elution treatment allows the impregnated resin to be reused.

Keywords: Adsorption, Chitosan, Equilibrium, Extraction, Ions, Iron(III), Metal Ion, Metals, Separation, Sorption

? Vincent, T. and Guibal, E. (2000), Non-dispersive liquid extraction of Cr(VI) by TBP/Aliquat 336 using chitosan-made hollow fiber. *Solvent Extraction and Ion Exchange*, **18** (6), 1241-1260.

Full Text: [2000\Sol Ext Ion Exc18, 1241.pdf](2000/Sol%20Ext%20Ion%20Exc18,%201241.pdf)

Abstract: TBP and alkylammonium extractants were investigated for chromate removal from dilute solutions using chitosan-made hollow fibers. Chromate is adsorbed by the chitosan fiber and simultaneously desorbed by the extractant. The influence of chromate concentration, extractant concentration, extractant volume on relative concentration decrease were investigated as a function of time. These experimental parameters barely influenced the decrease in the relative concentration. Fiber length is more significant in the control of the extraction kinetics. In recirculation flow mode, the relative concentration can be well described as an exponential function of time. The kinetic constant varies as a linear function of fiber length. Amine extractants (Aliquat 336, Alamine 336, Amberlite LA-2) are better extractants than TBP both from the kinetics and equilibrium standpoints. With Aliquat 336 the final Cr(VI) concentration tends to zero, while with TBP, the equilibrium is controlled by the volume of the extractant

Keywords: Back-Extraction, Equilibrium, Hexavalent Chromium, Membrane, Metal-Ions, Nondispersive Extraction, Recovery, Removal, Sorption, Stability

? Ruiz, M., Sastre, A. and Guibal, E. (2003), Osmium and iridium sorption on chitosan derivatives. *Solvent Extraction and Ion Exchange*, **21** (2), 307-329.

Full Text: [S\Sol Ext Ion Exc21, 307.pdf](S/Sol%20Ext%20Ion%20Exc21,%20307.pdf)

Abstract: Glutaraldehyde cross-linked chitosan exhibits a great affinity for osmium at pH 2: the sorption capacity can reach up to 3 mmol Os g-1 and the initial slope of the isotherm curve confirms that strong interactions exist between the biopolymer and osmium ions. In the case of iridium sorption, the affinity and the maximum sorption capacities are considerably lower than the levels we reached with osmium. The modification of the sorbent by grafting new amine groups [poly(ethyleneimine)] allows the sorption capacities to be increased while the grafting of thiourea did not significantly change sorption capacities. At the low sorbent dosage used in this study more than 90% of the total sorption was reached within the first six hours of contact. However, in the case of iridium after 12 hours of contact a significant release of metal is observed, it confirms that the interactions of the polymer with iridium are significantly weaker than those established between chitosan and osmium ions. Rhodium, rhenium, ruthenium are not significantly adsorbed indicating that a kind of sorption selectivity may be expected in the uptake of osmium, iridium but also platinum and palladium against rhodium, ruthenium, and rhenium.

Keywords: Chitosan, Osmium, Iridium, Sorption Isotherms, Uptake Kinetics, Desorption, Highly Porous Chitosan, Platinum-Group-Metals, Chemically-Modified Chitosan, Cross-Linked Chitosan, Gel Beads, Diffusion Properties, Palladium Sorption, Aqueous-Solutions, Chloride Media, Adsorption

? Zhang, A.Y., Wei, Y.Z. and Kumagai, M. (2003), Properties and mechanism of molybdenum and zirconium adsorption by a macroporous silica-based extraction resin in the MAREC process. *Solvent Extraction and Ion Exchange*, **21** (4), 591-611.

Full Text: [S\Sol Ext Ion Exc21, 591.pdf](S/Sol%20Ext%20Ion%20Exc21,%20591.pdf)

Abstract: To achieve effective separation of molybdenum and zirconium in the MAREC process, the adsorption properties and mechanism of Mo(VI) and Zr(IV) with a macroporous CMPO/SiO2-P (CMPO: octyl(phenyl)N,N-diisobutylcarbamoylmethylphosphine oxide) extraction resin have been studied. By investigating the influence of the aqueous concentrations of H+ and NO3- on the adsorption of Mo(VI), the composition of complex of Mo(VI) and CMPO/SiO2-P is determined as H2MoO4.2CMPO/SiO2-P for dilute aqueous HNO3 and H2MoO3 (NO3) 2.2CMPO/SiO2-P for concentrated aqueous HNO3, respectively. Similarly, the composition of Zr(IV) and CMPO/SiO2-P is determined as ZrO(NO3) 2.2CMPO/SiO2-P or Zr(NO2)4(.)2CMPO/SiO2-P in 0.3-4.0 M HNO3, while ZrO2.2H2O.2CMPO/SiO2-P is assumed for lower HNO3 concentration. Based on the compositions of Mo(VI) and Zr(IV) with CMPO/SiO2-P and the elution behavior of Mo(VI) and Zr(IV) by using 0.05 M diethylenetriaminepentaacetic acid (DTPA) at 0.01-1.OM HNO3, a dynamic interconversion equilibrium between the complexes of Mo(VI) or Zr(lV) and CMPO/SiO2-P is demonstrated to take place in the elution process. To verify the adsorption mechanism, the adsorption and elution behavior of Mo(VI) and Zr(IV) with 0.05 M DTPA-pH 2.0 was performed from a simulated high level radioactive liquid waste (HLLW) containing Pd(II), Gd(III), Y(III), Eu(III), Sm(III), Mo(VI), and Zr(IV). The results indicate that Mo(VI) and Zr(IV) not only can be efficiently eluted with 0.05 M DTPA-pH 2.0, but also the elution efficiency is much better than that of 0.5 M H2C2O4 previously used in the MAREC process. The reverse equilibrium of complexes between Mo(VI) or Zr(IV) and CMPO/SiO2-P in high and low acidity was demonstrated, respectively.

Keywords: Molybdenum, Zirconium, Cmpo Extraction Resin, Adsorption, Radioactive Liquid Waste, MAREC Process, Octyl(Phenyl)-N,N-Diisobutylcarbamoylmethylphosphine Oxide, Radiolytic Degradation, Solvent-Extraction, Fission-Products, Separation, Actinides, Cmpo, Chromatography, Constants, Behavior

? Luo, F., Li, D.Q. and Wu, Y.L. (2004), Extraction and separation of cadmium(II), iron(III), zinc(II), and europium(III) by Cyanex302 solutions using hollow fiber membrane modules. *Solvent Extraction and Ion Exchange*, **22** (1), 105-120.

Full Text: [S\Sol Ext Ion Exc22, 105.pdf](S/Sol%20Ext%20Ion%20Exc22,%20105.pdf)

Abstract: The mass transfer behaviors of Cd(II), Fe(III), Zn(II), and Eu(III) in sulfuric acid solution using microporous hollow fiber membrane (HFM) containing bis(2, 4, 4-trimethylpentyl)monothiophosphinic acid (commercial name Cyanex302) were investigated in this paper. The experimental results showed that the values of the mass transfer coefficients (K-w) decreased with an increase of H+ concentration and increased with an increase of extractant Cyanex302 concentration. The mass transfer resistance of Eu3+ was the largest because K-w value of Eu3+ was the smallest. The order of mass transfer rate of metal ions at low pH was Cd > Zn > Fe > Eu. Mixtures of Zn2+ and Eu3+ or of Zn2+ and Cd2+ were well separated in a counter-current circulation experiment using two modules connected in series at different initial acidity and concentration ratio. These results indicate that a hollow fiber membrane extractor is capable of separating the mixture compounds by controlling the acidity of the aqueous solution and by exploiting different mass transfer kinetics. The interfacial activity of Cyanex302 in sulfuric acid solution was measured and interfacial parameters were obtained according to Gibbs adsorption equation.

Keywords: Cadmium(II), Iron(III), Zinc(II), Europium(III), Hollow Fiber Membrane, Cyanex302, Liquid-Liquid-Extraction, Solvent-Extraction, Mass-Transfer, Cyanex-302, Copper, Cobalt(II), Samarium, Toluene, Acids, Media

? Valderrama, C., Cortina, J.L., Farran, A., Marti, V., Gamisans, X. and de las Heras, F.X. (2008), Characterization of azo dye (Acid Red 14) removal with granular activated carbon: Equilibrium and kinetic data. *Solvent Extraction and Ion Exchange*, **26** (3), 271-288.

Full Text: [2008\Sol Ext Ion Exc26, 271.pdf](2008/Sol%20Ext%20Ion%20Exc26,%20271.pdf)

Abstract: The work describes the sorption of an azo dye (Acid red 14) from aqueous solution onto Granular activated carbon (GAC) in order to characterize the sorption properties. Batch experiments were performed to determine loading isotherms at different pH values and evaluate the effect of the surface functional groups of the sorbent and the dye acid-base properties. The loading equilibrium data were modelled with Langmuir, Freundlich, and Redlich-Peterson isotherms. The maximum dye sorption capacity of GAC was determined as 31 g kg-1 at neutral and basic pH values. Kinetic experiments were carried out at different pH values and Acid Red 44 (AR14) concentrations. Three theoretical models (Pseudo first, pseudosecond order reaction models, and the Elovich model) were used to describe the dye sorption kinetics. The sorption rate constants were determined by graphical analysis of the proposed models. The study showed that sorption followed a pseudo-first order reaction model although the pseudo- second order reaction model provides an acceptable description of the sorption process.

Keywords: Acid Red 14, Activated Carbon, Adsorbents, Adsorption Behavior, Analysis, Anionic Dyes, Aqueous Solution, Aqueous-Solution, Azo Dye, Capacity, Carbon, Diffusion-Model, Dye, Dye Removal, Elovich Model, Equilibrium, Experiments, First, Freundlich, GAC, Granular Activated Carbon, Graphical Analysis, Isotherms, Kinetic, Kinetic Parameter, Kinetics, Langmuir, Model, Models, pH, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Rate Constants, Redlich-Peterson, Removal, Second Order, Second-Order, Solution, Sorbent, Sorption, Sorption, Sorption Capacity, Sorption Kinetics, Sorption Process, Surface Functional Groups, Systems, Waste, Water, Work

? Martínez-Lladó, X., de Pablo, J., Giménez, J., Ayora, C., Martí, V. and Rovira, M. (2008), Sorption of antimony(V) onto synthetic goethite in carbonate medium. *Solvent Extraction and Ion Exchange*, **26** (3), 289-300.

Full Text: [2008\Sol Ext Ion Exc26, 289.pdf](2008/Sol%20Ext%20Ion%20Exc26,%20289.pdf)

Abstract: The sorption kinetics of antimony(V) on synthetic goethite is very fast compared to the sorption of other metals on goethite (e.g. arsenic and selenium) and depends on temperature, with an activation energy of 49±9 kJ . mol-1 in the temperature range 15-35°C. Sorption isotherms have been developed at different temperatures and ionic strength values. The results have been modelled using a Langmuir isotherm and there is not a considerable influence of neither the temperature in the range studied (15°C-35°C), nor the ionic strength (between 0.001 and 0.01 mol . dm-3). Sorption is very high at pH values lower than 8, at more alkaline pH, the sorption decreases with pH, as expected considering the Antimony(V) predominating complex in solution, Sb(OH)6-. Triple-layer model successfully describes the data obtained by assuming a bidentate edge-shaiing surface complex of antimonate on the surface of goethite.

Keywords: Antimony, Sorption, Goethite, Surface Complexation Model, Humic-Acid, Soils, Oxides, Hematite, Waste

? Campos, K., Vincent, T., Bunio, P., Trochimczuk, A. and Guibal, E. (2008), Gold recovery from HCl solutions using Cyphos IL-101 (a quaternary phosphonium ionic liquid) immobilized in biopolymer capsules. *Solvent Extraction and Ion Exchange*, **26** (5), 570-601.

Full Text: [2008\Sol Ext Ion Exc26, 570.pdf](2008/Sol%20Ext%20Ion%20Exc26,%20570.pdf)

Abstract: Tetraalkyl phosphonium chloride (Cyphos IL-101), an ionic liquid (IL), was tested for gold recovery from HCl solutions: first in liquid/liquid extraction systems (using toluene and hexane as solvent) and in a second step, after being immobilized in a biopolymer composite matrix. SEM-EDAX analysis was used for the characterization of the resins. The sorption capacity reached up to 140 mgAu(III)g-1 in 1M HCl solutions. Base metals that do not form anionic chlorocomplexes and nitrate or chloride ions (at 5 gL-1) did not interfere with Au(III) binding. Gold binding probably occurs through the interaction of R3R’P+ with AuCl4-. The kinetics of sorption was carried out varying agitation speed, metal concentration, IL content, and resin drying. Intraparticle diffusion played an important role on the control of sorption kinetics. Gold could be desorbed from the loaded IL-impregnated resin using thiourea (in HCl solutions). The resin could be re-used for at least 4 cycles. The resins are specially adapted for the recovery of gold from low metal concentrations.

Keywords: Gold, Phosphonium Ionic Liquid, Sorption Isotherms, Diffusion, Desorption, Enclosing Cyanex-302 Extractant, Triisobutyl Phosphine Sulfide, Atomic Emission-Spectrometry, Process Waste Effluents, Printed Wiring Boards, Selective Recovery, Solvent-Extraction, Exchange-Resins, Piperazine Functionality, Palladium Recovery

? Kumaresan, R., Sabharwal, K.N., Srinivasan, T.G., Rao, P.R.V. and Dhekane, G. (2008), Studies on the sorption of palladium using cross-linked poly (4-vinylpyridine-divinylbenzene) resins in nitric acid medium. *Solvent Extraction and Ion Exchange*, **26** (5), 643-671.

Full Text: [2008\Sol Ext Ion Exc26, 643.pdf](2008/Sol%20Ext%20Ion%20Exc26,%20643.pdf)

Abstract: Various cross-linked (4, 8, and 12%) gel-type weak-base poly(4-vinylpyridine) (PVP) resins were studied for palladium recovery from nitric acid medium. The sorption of palladium was found to decrease with an increase in cross-linkage of the resin. 8 and 12% PVP resins exhibited maximum D Pd(II) values at 2-6M HNO3, whereas 4% PVP resin showed maximum D Pd(II) values at lower acidities (0.1M HNO3). FT-IR, SEM, and XPS techniques were used for the characterization of palladium-loaded resins. Detailed studies were carried out with the resin of modest cross-linkage i.e., 8% PVP resin. The sorption isotherm studies revealed that the maximum palladium loading approaches the theoretical capacity of the resin, presuming the sorption of palladium as divalent anion at 4M HNO3. The pseudo-second order kinetics model yielded the best fit for the experimental data of sorption kinetics. An increase in temperature accelerates the rate of palladium extraction and also the addition of chloride ions increases the palladium uptake. Column studies were performed using 4 and 8% PVP resins in 2 and 4M nitric acid concentrations. The loaded palladium could be eluted efficiently with acidic thiourea solution.

Keywords: Anion-Exchange Resin, Capacity, Characterization, Chloride, Column, Complexes, Cross-Linked, Data, Experimental, Extraction, Fission Products, FT-IR, FTIR, Ion Exchange, Ion-Exchange, Isotherm, Kinetics, Kinetics Model, Loading, Model, Nitrate, Palladium, Palladium Recovery, Pd(II), Platinum, Poly(4-Vinylpyridine) Resins, Precious Metals, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Ray Photoelectron-Spectroscopy, Recovery, Removal, Resin, Resins, SEM, Separation, Solution, Solvent-Extraction, Sorption, Sorption Isotherm, Sorption Kinetics, Techniques, Temperature, Uptake, X-Ray Photoelectron Spectroscopy, XPS

? Sun, Y.W., Wang, Y.J., Yang, L., Lu, Y.C. and Luo, G.S. (2008), Heavy metal ion sorption properties of porous glass beads with a core-shell structure. *Solvent Extraction and Ion Exchange*, **26** (5), 672-685.

Full Text: [2008\Sol Ext Ion Exc26, 672.pdf](2008/Sol%20Ext%20Ion%20Exc26,%20672.pdf)

Abstract: Porous glass beads with a core-shell structure have been successfully prepared through subcritical water treatment. The product has high capacity and fast mass transfer property due to its structure, and may serve as an inorganic adsorbent. Accordingly, the kinetics, the equilibrium isotherm, and the column breakthrough curve of this material were measured using Cu(II) as a model target ion. The results indicate that the material has an advantage over some other adsorbents, such as kaolinite and clinoptilolite, in both adsorption capacity and kinetics. The adsorption capacity for Cu(II) is almost twice as much as that of the Na-mordenite. The pseudo-second order kinetic and the Langmuir isotherm fit the experimental data. An adsorption mechanism was hypothesized in which the non-bridging oxygen ions in the glass network were hypothesized to be the functional site.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Mechanism, Adsorptive Removal, Ambient Conditions, Beads, Breakthrough, Breakthrough Curve, Capacity, Clinoptilolite, Column, Core Shell Structure, Core-Shell, Core-Shell Structure, Cu(II), Data, Desulfurization, Equilibrium, Equilibrium Isotherm, Exchange, Experimental, Glass, Heavy Metal, Heavy Metal Ion, Hydrothermal Treatment, Ion Exchange, Isotherm, Kaolinite, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Mass Transfer, Mechanism, Metal, Model, Network, Oxygen, Porous Glass, Property, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Silica-Gel, Site, Sorption, Structure, Subcritical Water Treatment, Support, Tert-Butanethiol, Treatment, Water, Water Treatment, Zeolite

? Wołowicz, A. and Hubicki, Z. (2010), Selective adsorption of Palladium(II) complexes onto the chelating ion exchange resin Dowex M 4195-kinetic studies. *Solvent Extraction and Ion Exchange*, **28** (1), 124-159.

Full Text: [2010\Sol Ext Ion Exc28, 124.pdf](2010/Sol%20Ext%20Ion%20Exc28,%20124.pdf)

Abstract: The chelating ion exchange resin - Dowex M 4195 was used in palladium(II) complexes adsorption from the acidic solutions. This study discusses the sorption kinetics, and more specifically the interparticle diffusion behavior of palladium(II) onto Dowex M 4195. The adsorption studies were used to determine the amount of palladium(II) complexes uptake (resin loading), the distribution coefficients, and the recovery efficiency of Pd(II) complexes. The influence of the agitation speed, the beads size (mean radius of swollen particles), the palladium concentrations, as well as acid concentrations (ionic strength of solutions), the macrocomponent addition (sodium chloride), and the phases contact time was also discussed. Moreover, the effect of temperature was taken into account during the determination of the isotherms. The experimental data obtained at 100 mu g/cm(3) Pd(II) initial concentration were applied to the kinetic models, and the sorption parameters as well as the normal standard deviation were calculated. Moreover, the Langmuir, Freundlich, and Tempkin-Pyzhev isotherm models were applied and the isotherms parameters were calculated.

Keywords: Adsorption, Agitation, Aqueous-Solution, Base Metals, Beads, Behavior, Chelating Ion Exchange Resin, Chitosan Derivatives, Chloride, Concentration, Data, Diffusion, Distribution, Efficiency, Experimental, Freundlich, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Ionic Strength, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Liquid-Phase Adsorption, Loading, Metal-Ions, Methylene-Blue, Models, Normal, Palladium, Palladium(II), Particles, Pd(II), Platinum, Preconcentration, Recovery, Resin, Separation, Size, Sodium, Sodium Chloride, Solutions, Sorption, Sorption Kinetics, Standard, Strength, Temperature, Time, Uptake

? Zhang, A.Y., Xiao, C.L., Hu, Q.H. and Chai, Z.F. (2010), Synthesis of a novel macroporous silica-calix[4]arene-crown supramolecular recognition material and its adsorption for cesium and some typical metals in highly active liquid waste. *Solvent Extraction and Ion Exchange*, **28** (4), 526-542.

Full Text: [2010\Sol Ext Ion Exc28, 526.pdf](2010/Sol%20Ext%20Ion%20Exc28,%20526.pdf)

Abstract: A novel macroporous silica-based 25,27-bis(iso-propyloxy)calix[4]arene-26,28-crown-6 (BiPCalix[4]C6) supramolecular recognition material, BiPCalix[4]C6/SiO2-P, was synthesized. It was prepared by impregnation and the immobilization of the BiPCalix[4]C6 molecule into the pores of the macroporous SiO2-P particles. The adsorption of Cs(I) and some typical elements Na(I), K(I), Rb(I), Sr(II), Ba(II), Ru(III), Mo(VI), La(III), and Y(III) onto the BiPCalix[4]C6/SiO2-P material was investigated. The effects of the HNO3 concentration, contact time, and temperature on the adsorption of the tested metals were studied. It was found that at the optimum concentration of 3.0 M HNO3, BiPCalix[4]C6/SiO2-P exhibited excellent adsorption ability and high selectivity for Cs(I) over all the tested elements, which showed weak or almost no adsorption except Rb(I). A pseudo-second-order model was found to be able to describe the adsorption kinetics of Cs(I). The chemical complexation of Cs(I) with BiPCalix[4]C6/SiO2-P was considered to be the rate-controlling step. Meanwhile, the thermodynamic parameters of the Cs(I) adsorption, H, G, and S were determined. The adsorption of Cs(I) onto BiPCalix[4]C6/SiO2-P was exothermic. It was demonstrated that in 3.0 M HNO3, the novel macroporous BiPCalix[4]C6/SiO2-P material shows promise for the partitioning of Cs(I) from highly active liquid waste.

Keywords: 1,3-Alternate, Adsorption, Adsorption Kinetics, Cesium, Chemical, Complexation, Concentration, Crown, Exothermic, Extraction Chromatographic Resin, Highly Active, Highly Active Liquid Waste, Immobilization, Impregnated Polymeric Composite, Impregnation, Kinetics, Liquid, Macroporous, Macroporous Silica-Based Support, Metals, Model, N-Butyl Phosphate, Particles, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Selectivity, Separation, Solvent-Extraction, Sorption, Strontium, Supramolecular Recognition Material, Synthesis, Temperature, Thermodynamic, Thermodynamic Parameters, Waste

? Wawrzkiewicz, M. (2010), Application of weak base anion exchanger in sorption of tartrazine from aqueous medium. *Solvent Extraction and Ion Exchange*, **28** (6), 845-863.

Full Text: [2010\Sol Ext Ion Exc28, 845.pdf](2010/Sol%20Ext%20Ion%20Exc28,%20845.pdf)

Abstract: Decolorization of wastewaters containing dyes is a worldwide problem for which diverse technologies have been applied. In this study, the removal of tartrazine dye from aqueous solutions by the weak base anion exchanger Amberlite FPA51 was investigated as a function of phase contact time, anion exchanger particle size, solution pH, initial dye concentration, and temperature. The amounts of tartrazine adsorbed at equilibrium were found to be 9.9, 19.9, 29.9, and 49.7 mg/g for the dye solutions of the initial concentrations 100, 200, 300, and 500 mg/L, respectively. The maximum monolayer capacity Q0 calculated from the Langmuir equation was 140.8 mg/g. The kinetic data obtained at different concentrations were modelled using the pseudo-first order and the pseudo-second order equations. The intraparticle diffusion model as well as the Boyd equation were applied to identify the rate controlling step of the adsorption.

Keywords: Adsorbent, Adsorption, Anion Exchanger, Aqueous Solutions, Capacity, Concentration, Data, Diffusion, Diffusion Model, Dye, Dyes, Equilibrium, Function, Hazardous Dye, Indigo Carmine Dye, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Equation, Malachite-Green, Model, Monolayer, Particle Size, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Removal, Rice Husk, Size, Solution, Solutions, Sorption, Tartrazine, Technologies, Temperature, Waste Materials, Wastewaters

# Title: Solvent Extraction Research and Development-Japan

Full Journal Title: Solvent Extraction Research and Development-Japan

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Ohto, K., Senba, Y., Eguchi, N., Shinohara, T. and Inoue, K. (1999), Solid phase extraction of metal ions on resins impregnated with carboxylates of phenolic oligomers. *Solvent Extraction Research and Development-Japan*, **6**, 101-112.

Full Text: 1999\Sol Ext Res Dev-Jap6, 101.pdf

Abstract: Four types of resins impregnated with phenolic oligomer carboxylic acids have been prepared to investigate the adsorption behavior of divalent metal ions, such as lead, copper, zinc, and cobalt, and leakage of the impregnated extractants to the aqueous solution. The loss of the extractants to the aqueous solution was negligible except for the monomeric extractant. The impregnated resins have been found to be capable of extracting metal ions. The following sequence of metal ion selectivity was found for all resins. Pb >> Cu > Zn > Ni. This selectivity is in accordance with that observed for liquid-liquid extraction reagents. The adsorption of lead on all resins is significantly high, while that of other ions is very low. In particular, that of other metal ions on the resins impregnated by calix[4]arene carboxylate is remarkably low. This may be attributable to the size-exclusion effect.

Keywords: Solvent-Extraction, Calixarenes, Derivatives, Acid, Separation, Calix<4>Arene, Selectivity, Silver(I), Sorption, Behavior

# Title: Sorption and Biosorption

Volesky, B. (2003), *Sorption and Biosorption*, BV Sorbex, Inc. Montreal, Canada.

# Title: Sotsialnye Aspekty Zdorovya Naseleniya

Full Journal Title: Sotsialnye Aspekty Zdorovya Naseleniya

ISO Abbreviated Title:

JCR Abbreviated Title:

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Publisher Address:

Subject Categories:

Impact Factor

? Kaĭgorodova, T.V. (2009), Information support for decision making in medicine and health care. *Sotsialnye Aspekty Zdorovya Naseleniya*, **12** (4), 17. Electronic resource (Date Treatment May 7, 2011). URL: <http://vestnik.mednet.ru/content/view/162/30/lang,ru/>

Full Text: [2009\Sot Asp Zdo Nas12, 17.pdf](2009/Sot%20Asp%20Zdo%20Nas12,%2017.pdf)

# Title: Sotsiologicheskie Issledovaniya

Full Journal Title: Sotsiologicheskie Issledovaniya

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Fomin, E.A. and Fedorova, N.M. (1999), Health attitudes strategies. *Sotsiologicheskie Issledovaniya*, **11**, 35 (7 pages).

Abstract: ‘Health attitudes strategies’ (by Eduard Fomin and Nataliya Fedorova) is based on a survey of the life quality indicators and attitudes of the population towards individual health. The empirical basis of the study is formed by a survey carried out in the large cities of Russia (Petersburg, Samara and Pskov) involving 2800 persons aging over 18 (1997, jointly with Finnish Institute for professional health). Health was seen in the study as a natural and social resource and a factor affecting general evaluation of the life quality as a whole. A particular aspect of the study formed the attention paid in the survey to the gender variations of the urban inhabitants’ attitudes to their health. The findings and their implications are extensively discussed.

# Title: South African Journal of Botany

Full Journal Title: South African Journal of Botany

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0254-6299

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Erftemeijer, P., Semesi, A. and Ochieng, C. (2001), Challenges for marine botanical research in East Africa: Results of a bibliometric survey. *South African Journal of Botany*, **67** (3), 411-419.

Full Text: 2001\Sou Afr J Bot67, 411.pdf

Abstract: A bibliometric review was made of published and grey literature on marine botanical research in the Western Indian Ocean (1950-2000) to evaluate the current status of marine botanical research in the East African region. All literature references indexed in Aquatic Sciences and Fisheries Abstracts, Life Sciences Collection, and other computerised databases, as well as annual reports, bibliographies, web-sites, review articles, cross-references, papers and reports published in grey literature - obtained from various institutions and libraries operating in this region - were systematically analysed to provide a diagnosis of strengths and weaknesses in the marine botanical research in the region to date. The results of the analysis are discussed in order to identify the main challenges to be faced as a solid basis for future research efforts in marine botany in the East African region.

Keywords: Africa, African, Analysis, Annual Reports, Bibliographies, Bibliometric, Bibliometric Survey, Databases, Diagnosis, Indian, Indian Ocean, Institutions, Literature, Papers, References, Research, Review, Status, Survey

? Nigro, S.A., Stirk, W.A. and van Staden, J. (2002), Optimising heavy metal adsorbance by dried seaweeds. *South African Journal of Botany*, **68** (3), 333-341.

Abstract: Industrialisation has resulted in large-scale production of anthropogenic pollutants, particularly heavy metals. Existing industrial techniques for the purification of waste water are expensive. A cheaper alternative may be ‘bioremoval’, that is, the accumulation and concentration of pollutants from aqueous solutions using biological material. The adsorption of copper, zinc and cadmium using two dried seaweeds Ecklonia maxima and Laminaria pallida (order Laminariales) and Kelpak waste (also made from Ecklonia maxima), a byproduct from the manufacture of the seaweed concentrate Kelpak, were investigated under laboratory conditions, to determine some factors affecting heavy metal adsorption. Ion adsorption from single and mixed metal ion solutions of 10 mgl-1 and 100 mgl-1 containing copper, zinc and cadmium were tested at various temperatures and pH. Optimum adsorption occurred at pH 3 and pH 7 and Kelpak waste had equal or superior adsorption ability to dried Ecklonia maxima and Laminaria pallida, particularly for copper. Optimum adsorption occurred at temperatures of 20degreesC and 30degreesC. Heavy metal adsorption trends by the individual seaweed biosorbent remained constant regardless of the species of anion present. Drying of the experimental material (fan air and oven drying at 85degreesC) prior to adsorption cycles resulted in more efficient ion uptake, particularly after additional rehydration. Heavy metal uptake was monitored over a number of semi-continuous adsorption cycles, using the same biomasses. Ion uptake was the most efficient after 2-4 adsorption cycles.

Keywords: Adsorption, Removal, Biosorption, Copper, Derivatives, Cadmium, Biomass, Ions

# Title: South African Journal of Chemistry-Suid-Afrikaanse Tydskrif Vir Chemie

Full Journal Title: [South African Journal of Chemistry-Suid-Afrikaanse Tydskrif Vir Chemie](http://www.scopus.com/scopus/source/sourceInfo.url?sourceId=21544)

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JCR Abbreviated Title:

ISSN: 0379-4350

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Publisher Address:

Subject Categories:

: Impact Factor

? Ofomaja, E.A., Unuabonah, I.E. and Oladoja, N.A. (2005), Removal of lead from aqueous solution by palm kernel fibre. *South African Journal of Chemistry-Suid-Afrikaanse Tydskrif Vir Chemie*, **58**, 127-130.

Full Text: [2005\Sou Afr J Che, 58, 127.pdf](2005/Sou%20Afr%20J%20Che,%2058,%20127.pdf)

Abstract: The sorption of lead on palm kernel fibre, an agricultural waste product, has been studied. The sorption process was studied as a function of initial lead concentration and initial solution pH. The percentage lead removal was found to increase with increasing initial solution pH up to pH 5 and then to decrease as pH was increased to 6. The pseudo-second order kinetic rate model was employed in the analysis of the kinetics of lead uptake onto the palm kernel fibre. The results show that the pseudo-second order model fits the experimental data with high coefficients of determination (r(2). The equilibrium sorption capacity was found to be 33.33 mg g-1 when 1.0 g of fibre was contacted with 90 mg dm-3 of lead solution at pH 5. Mathematical expressions were derived to relate the pseudo-second order rate constant, k, and the change in solution pH with initial lead concentration.

Keywords: Palm Kernel Fibre, Kinetics, Lead(II), Sorption, Change in Solution pH, Sorption, Blood, Adsorption, Exposure, Children, Cadmium, Waste, Ions, Peat, Dyes

? Israel, O.K. and Ekwumemgbo, P.A. (2010), Kinetics of the adsorption of bovine serum albumin of white wine model solutions onto activated carbon and alumina. *South African Journal of Chemistry-Suid-Afrikaanse Tydskrif Vir Chemie*, **63**, 20-24.

Full Text: Sou Afr J Che63, 20.pdf

Abstract: This study investigates the kinetics of adsorption of bovine serum albumin, BSA, in white wine model solutions onto activated carbon, AC, and alumina, AL. Pseudo-first order and pseudo-second order models were applied to determine the rate and mechanism of adsorption of the white wine protein during the haze removal process. The results showed that the average amount of adsorbed BSA onto AC was 1.10±0.07 times higher than that onto AL. Statistical analysis by two-way ANOVA showed no significant difference in the amount of BSA adsorbed onto the two adsorbents, but a statistically significant difference existed in the amount adsorbed by variation of incubation time. A positive correlation exists between the amounts of BSA adsorbed onto AC and AL. The kinetics of the adsorption were found to be based on the assumption of an intra-particle diffusion-controlled pseudo-second order mechanism, with adsorption rate constants being higher at lower adsorbate concentrations.

Keywords: Activated Carbon, Adsorption, Adsorption Rate Constant, Haze Removal, Kinetic Modelling, Kinetics, Removal, White Wine

# Title: South African Journal of Library and Information Science

Full Journal Title: South African Journal of Library and Information Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

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Full Text: [2005\Sou Afr J Lib Inf Sci71, 247.pdf](2005/Sou%20Afr%20J%20Lib%20Inf%20Sci71,%20247.pdf)

Abstract: The paper analyses and demonstrates the application of informetrics by use of descriptive bibliometrics to determine the status and trend of indigenous knowledge (IK) development from 1990-2002. IK records published during that period have been analyzed by use of eight databases hosted by EBSCOHost and SABINET by document type, by growth of the literature over the period, by source where the document is published, by document affiliation, by subject domain, and by nature of authorship among others. A positive growth of IK is observed with strong representation in AGRICOLA database and recommendations are given for a follow up and further research. It is recognized that the paper could provide useful information for decision support in knowledge management in general and knowledge management in particular.

Keywords: Affiliation, Analyses, Analysis, Application, Authorship, Bibliometrics, Database, Databases, Decision, Decision Support, Development, Follow-Up, General, Growth, Indigenous Knowledge, Information, Informetrics, Knowledge, Knowledge Management, Literature, Management, Publications, Recommendations, Records, Representation, Research, Source, Support, Trend

# Title: South African Journal of Psychiatry

Full Journal Title: [South African Journal of Psychiatry](http://www.sajp.org.za/index.php/sajp/index)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Vogelzang, B.H., Scutaru, C., Mache, S., Vitzthum, K., Kusma, B., Mutawakel, K., Groneberg, D.A. and Quarcoo, D. (2010), Cannabis publication analysis using density-equalising mapping and research output benchmarking. *South African Journal of Psychiatry*, **16** (4), 131-137.

Full Text: 2010\Sou Afr J Psy16, 131.pdf

Abstract: Background. Canrabis has been a topic of political and medical controversy in many countries over the past century. Although many publications on this topic are available, there is currently no comprehensive evaluation of global research activities in the field. Objective. This study was conducted in order to provide a quantitative and qualitative analysis of the worldwide research output on cannabis. Methods. In a quantitative approach, items concerning cannabis published between 1900 and 2008 were retrieved from the ISI Web of Science databases developed by the Thompson Institute of Scientific Information and analysed using scientometric methods. In a second step, research fields of growing interest were identified. Results. We found that publications on this topic increased during the late 1960s, as well as during the period 1990 2008. We noted that South Africa was one of the countries with a high research output, having published numerous articles on cannabis. A comparison of cannabis with other drugs (e.g. alcohol, tobacco, cocaine and heroin) showed that in relation to the proportion of respective drug users, cocaine and heroin are overly represented in terms of research output. When analysing the main subjects of the publications, psychiatry was prominent, especially with regard to research on psychosis. Conclusion. There is increasing interest in research on cannabis. The research only partially reflects the drug’s importance with regard to number of users.

Keywords: Africa, Alcohol, Analysis, Approach, Benchmarking, Cannabis, Cocaine, Comparison, Databases, Drug, Drugs, Evaluation, Field, ISI, ISI Web of Science, Mapping, Medical, Methods, Psychiatry, Psychosis, Publication, Publications, Qualitative, Qualitative Analysis, Research, Science, Scientometric, South Africa, Tobacco, View, Web of Science

# Title: South African Journal of Science

Full Journal Title: [South African Journal of Science](http://www.sajs.co.za/index.php/SAJS/issue/archive), [South African Journal of Science](http://www.scielo.org.za/scielo.php?script=sci_issues&pid=0038-2353&lng=en&nrm=iso)

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JCR Abbreviated Title: S Afr J Sci

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Language: Multi-Language

Publisher: Bureau Scientific Publ

Publisher Address: PO Box 1758, Pretoria 0001, South Africa

Subject Categories:

Multidisciplinary Sciences: Impact Factor 0.670, 22/50 (2007), Impact Factor 0.506, 29/50 (2007), Impact Factor 0.596, 25/57 (2010)

? Pouris, A. (1986), The *South African Journal of Science*: A bibliometric evaluation. *South African Journal of Science*, **82** (8), 401-402.

Full Text: 1986\Sou Afr J Sci82, 401.pdf

Keywords: Bibliometric, Evaluation

? Pouris, A. (1989), Strengths and weaknesses of *South African Science*. *South African Journal of Science*, **85** (10), 623-626.

Full Text: 1989\Sou Afr J Sci85, 623.pdf

Abstract: The relative strengths of 108 scientific specialities in South Africa have been identified for the period 1981-1985, on the basis of bibliometric and citation analysis. Five subject areas are found to be among the top ten in the world: ornithology (4th), water resources (5th), general and internal medicine (7th), ecology (8th), and zoology (10th). We argue that the natural environment and mining have influenced the direction of science in South Africa. These findings have implications for science policy in the country.

? Pouris, A. (1996), The writing on the wall of South African science: A scientometric assessment. *South African Journal of Science*, **92** (6), 267-271.

Full Text: 1996\Sou Afr J Sci92, 267.pdf

Abstract: This article reports on an investigation of the health of academic science in South Africa in terms of papers published over the period 1981-1994. It is suggested that national scientific performance should be assessed as interim results of ‘marathon races and that mapping in the matrix Publication Ratio -Relative Citation Index can provide useful insights into disciplinary priorities and their trends, particularly for countries with pluralistic scientific systems. We argue that it is an unfortunate irony that South Africa was relatively strong in science at a time when this activity was less crucial than it is today in determining economic performance and international competitiveness. In the 1990s, South African science is losing ground when the winning economies and industries are becoming increasingly science intensive.

The disciplinary mapping of South African science confirms our previous findings that the country’s natural wealth still determines national research priorities. We further suggest that national funding policies have strengthened the traditionally most active disciplines and that the country would need innovative new mechanisms in order to redirect the scientific system.

Keywords: Africa, Assessment, Country, Economic, Funding, Health, International, Investigation, Mapping, Matrix, Mechanisms, Papers, Performance, Policies, Research, Research Priorities, Science, Scientific Performance, Scientometric, South Africa, Systems, Trends, Wealth

? de Villiers, M.M. and Malan, S.F. (1997), Publish or perish: How is pharmacy research coping in a changing South Africa? *South African Journal of Science*, **93** (8), 355-358.

Full Text: 1997\Sou Afr J Sci93, 355.pdf

Abstract: Taking into account the needs of a changed South Africa, this study was conducted to evaluate the activity, of pharmacy research in the country. Research output from academic institutions in South Africa was compared to the rest of Africa, the United States, Australia and Europe. This was done by surveying research outputs as cited in two scientific databases, International Pharmaceutical Abstracts and the Science Citation Index. The attitude towards research at a major faculty of pharmacy in South Africa was also tested using an adapted Motivated Strategies of learning Questionnaire. Research in pharmacy disciplines in South Africa was found to be strong, and has been so since 1970, if one considers the size of the country and the numbers involved in research. A trend seen world-wide over the last five years is for pharmacy research to become orientated more towards problem solving especially in collaboration with the pharmaceutical industry In South Africa, two of the smaller pharmacy schools seem to have adapted better to this strategy. This led to a marked increase in their research output.

Keywords: Africa, Attitude, Citation, Collaboration, Databases, Europe, Learning, Research, Research Output, Schools, Science, Science Citation Index, South Africa, Strategy, Trend

? Lotter, L. (1998), Responsible Care: A key element in the chemical industry’s approach to sustainable development. *South African Journal of Science*, **94** (9), 414-418.

Full Text: [1998\Sou Afr J Sci94, 414.pdf](1998/Sou%20Afr%20J%20Sci94,%20414.pdf)

Abstract: The concept of sustainable development is being adopted by an increasing number of international business associations in recognition of the necessity to transform the way business is done in relation to the environment. The Responsible Care initiative is the chemical industry’s chosen vehicle for improving health, safety and environmental performance. The initiative has been adopted by 41 countries and committed companies account for 85% of the global manufacture of chemicals. The initiative is described in terms of its responsero the requirements of sustainable development.

? Jeenah, M. and Pouris, A. (2008), South African research in the context of Africa and globally. *South African Journal of Science*, **104** (9-10), 351-354.

Full Text: [2008\Sou Afr J Sci104, 351.pdf](2008/Sou%20Afr%20J%20Sci104,%20351.pdf)

Abstract: The quality and quantity of research publications are used as benchmarks to monitor the performance of South Africa’s national system of innovation. The indicators are pertinent to the policies of the department of education, which distributes funds for research at institutions of higher education by measuring the volume of research outputs. In this article, we present a scientometric assessment of research in South Africa in the context of the rest of Africa and in comparison with Brazil and India-two countries with which South Africa aims to develop strong scientific ties. We find that South Africa has published a significant number of papers in all 22 disciplines represented in the isi’s essential science indicators. The largest numbers of journal articles in a 10-year period (1996-2005) Were published in the categories clinical medicine, and in plant and animal sciences, with over 7000 papers each. Three groupings, namely, chemistry, geosciences, and environmental, ecology, form the second cluster of disciplines in terms of the highest number of publications (2966, 2488 And 2386, respectively). In all 22 subject categories, India and Brazil are rated higher than South Africa in terms of number of publications, but South Africa is ranked above these countries in relation to citations per paper in all disciplines. Egypt outranked South Africa in three disciplines in the period 1995-2004, namely, chemistry, engineering, and materials science, as did Nigeria in agriculture in 1996-2005. In addition to the three disciplines in the earlier period, Egypt outranked South Africa in 1996-2005 in physics, agricultural sciences, and pharmacology, toxicology. However, South Africa scored higher than both African countries in all disciplines in terms of citations per paper.

Keywords: Africa, African, Agricultural, Agricultural Sciences, Agriculture, Assessment, Chemistry, Citations, Clinical, Cluster, Comparison, Context, Education, Egypt, Engineering, Geosciences, Higher Education, Indicators, Innovation, Institutions, Journal, Journal Articles, Medicine, National, Papers, Performance, Plant, Policies, Publications, Quality, Research, Research Publications, Science, Science Indicators, Sciences, Scientometric, Sector, Volume

? Johnson, S.D. (2009), Darwin’s legacy in South African evolutionary biology. *South African Journal of Science*, **105** (11-12), 403-409.

Full Text: [2009\Sou Afr J Sci105, 403.pdf](2009/Sou%20Afr%20J%20Sci105,%20403.pdf)

Abstract: In the two decades after publication of the Origin of Species, Charles Darwin facilitated the publication of numerous scientific papers by settler naturalists in South Africa. This helped to establish the strong tradition of natural history which has characterised evolutionary research in South African museums, herbaria and universities. Significant developments in the early 20th century included the hominid fossil discoveries of Raymond Dart, Robert Broom, and others, but there was otherwise very little South African involvement in the evolutionary synthesis of the 1930s and 1940s. Evolutionary biology developed into a distinct discipline in South Africa during the 1970s and 1980s when it was dominated by mammalian palaeontology and a vigorous debate around species concepts. In the post-apartheid era, the main focus of evolutionary biology has been the construction of phylogenies for African plants and animals using molecular data, and the use of these phylogenies to answer questions about taxonomic classification and trait evolution. South African biologists have also recently contributed important evidence for some of Darwin’s ideas about plant-animal coevolution, sexual selection, and the role of natural selection In speciation. A bibliographic analysis shows that South African authors produce 2-3% of the world’s publications in the field of evolutionary biology, which Is much higher than the value of about 0.5% for publications in all sciences. With its extraordinary biodiversity and well-developed research infrastructure, South Africa is an ideal laboratory from which to advance evolutionary research.

Keywords: Adaptation, Basal Metabolic-Rate, Bibliometrics, Biodiversity Hotspot, Cape Flora, Classification, Ecology, Fire, Plants, Pollination, Publication, Publications, Radiation, Research, Research Trends, Sexual Selection, South Africa, Speciation, Speciation, Species, Species Concepts, Universities

? Sooryamoorthy, R. (2010), The internationalisation of South African medical research, 1975-2005. *South African Journal of Science*, **106** (7-8), 19-25.

Full Text: [2010\Sou Afr J Sci106, 19.pdf](2010/Sou%20Afr%20J%20Sci106,%2019.pdf)

Abstract: South Africa’s record in the production of scientific knowledge in medicine is remarkable, but attempts have yet to be made to examine its distinctive characteristics. This is critical to the understanding of its nature, trends and the directions which it is taking today. Using the publication records extracted from the Science Citation Index (SCI) of the ISI Web of Science for a 3-decade period from 1975 to 2005, with 5-year windows, I have examined the salient characteristics of medical research in South Africa in terms of, (1) the number of publications, (2) type of publications (sole/co-authored), (3) collaboration (domestic/international), (4) affiliation sector of authors and collaborators, (5) regional origin of collaborators, (6) publication outlets and (7) citations, in comparison with ‘all subjects’ covered in the database concerned. This analysis shows that the contribution of medical publications to the total output of South African scholars is shrinking (25% in 1980 to 8% in 2000). Papers produced in collaboration are growing in number (increased by 17% during 1975-2005). While domestic collaboration declined by 24%, international collaboration grew from 4% of total papers in 1975 to 48% in 2005. South African medical researchers now publish more in foreign-originated journals (from 20% in 1975 to 75% in 2005) than in local journals and work mostly in universities, hospitals and research institutes, they collaborate with overseas partners from as many as 56 countries. Significantly, collaboration with Western European partners has increased 45-fold from 1975-2005. This study showed that a marked degree of internationalisation (measured in terms of international collaboration, publications in foreign journals and the number of citations) of South African medical research is taking place and that this trend is likely to continue in the future.

Keywords: Citation, Citations, Collaboration, Contribution, Domestic Collaboration, Impact, Indicators, International Collaboration, Internationalisation, ISI, Journals, Medical Research, Medicine, Nations, Production, Publication, Publications, Research, Researchers, SCI, Science, Science Citation Index, Trend

? Kahn, M. (2011), A bibliometric analysis of South Africa’s scientific outputs - some trends and implications. *South African Journal of Science*, **107** (1-2), 27-32.

Full Text: [2011\Sou Afr J Sci107, 27.pdf](2011/Sou%20Afr%20J%20Sci107,%2027.pdf)

Abstract: The paper examines the change in volume of South African publications as indexed to the Web of Science over the periods 1990-1994 and 2004-2008. It was noted that publication volumes have increased sharply even while the stock of researchers has remained static. A number of factors may account for the rise including the increase in the Department of Education publication subsidy, the increase in the number of South African journals indexed to the Web of Science and a shift in focus to fields with higher publication propensity. For example, it was noted that a new growth area has emerged in the field of infectious diseases. The publication count by author institution showed that collaboration with foreign authors has increased considerably across the two periods and it is suggested that it is this factor that best accounts for the rise in volume. The concentration by subject area permitted some judgement to be made regarding the prospects for the five grand challenges of the Ten Year Innovation Plan. Lastly, it was noted that if it is collaboration that is driving the volume increase, the system is vulnerable to offshore changes.

Keywords: Analysis, Authors, Bibliometric, Bibliometric Analysis, Changes, Collaboration, Concentration, Diseases, Driving, Field, Growth, Infectious Diseases, Journals, Publication, Publications, Science, Trends, Volume, Web of Science

? Chuang, K.Y., Chuang, Y.C., Ho, M. and Ho, Y.S. (2011), Bibliometric analysis of public health research in Africa: The overall trend and regional comparisons. *South African Journal of Science*, **107** (5/6), 54-59.

Full Text: [2011\Sou Afr J Sci107, 1.pdf](2011/Sou%20Afr%20J%20Sci107,%201.pdf), [2011\Sou Afr J Sci-Chuang.pdf](2011/Sou%20Afr%20J%20Sci-Chuang.pdf)

Abstract: Background: Many diseases in Africa can be prevented with appropriate public health interventions. Methods: This study aimed to assess the bibliometric characteristics of public health related research articles published by researchers in African institutions from 1991 to 2005. Data used in this research were obtained from the online version of the ISI Web of Science: SCI-Expanded (Science Citation Index Expanded). Articles published between 1991 and 2005, that had the phrase ‘public health’ in the title, author keywords, or abstract, and have at least one author whose contact address was from an African country were selected for analysis. Results: The annual number of public health related articles published by African researchers significantly increased over the studied period. It increased from 28 articles in 1991 to 135 articles in 2005, a 382% increase. International collaboration also increased from 45% during 1991-1995, to 52% during1996-2000, and to 67% during 2001-2005. Collaborations were mostly with European and North American countries. Keywords, subject categories, and collaboration patterns of articles varied across regions, reflecting differences in needs and collaboration networks. Conclusions: Public health related research output, as well as international collaborations, have been increasing in Africa. Regional variation observed in this study may assist policy makers to facilitate the advancement of public health research in different regions of Africa, and could be useful for international organizations in identifying needs and to allocate research funding. Future bibliometric analyses of articles published by African researchers, can consider conducting regional comparisons using standardized methods, as well as describing the overall patterns, in order to provide a more-comprehensive view of their bibliometric characteristics.

Keywords: African, Public Health, SCI, Scientometrics, Research Trend

# Title: South African Medical Journal

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Publisher: Med Assoc S Africa

Publisher Address: Med House Central SQ 7430 Pinelands Priv Bag X1, Johannesburg, South Afric

Subject Categories:

Medicine, General & Internal: Impact Factor

? Leary, W.P., Reyes, A.J., Lockett, C.J., Arbuckle, D.D. and Vanderbyl, K. (1983), Magnesium and deaths ascribed to ischemic-heart-disease in South-Africa: A preliminary-report. *South African Medical Journal*, **64** (20), 775-776.

Full Text: [1983\Sou Afr Med J64, 775.pdf](1983/Sou%20Afr%20Med%20J64,%20775.pdf)

Von Schirnding, Y.E.R., Fuggle, R.F. and Bradshaw, D. (1991), Factors associated with elevated blood lead levels in inner city Cape Town children. *South African Medical Journal*, **79** (4), 454-456.

Full Text: [1991\Sou Afr Med J79, 454.pdf](1991/Sou%20Afr%20Med%20J79,%20454.pdf)

? Jooste, P.L., Weight, M.J. and Kriek, J.A. (1997), Iodine deficiency and endemic goitre in the Langkloof area of South Africa. *South African Medical Journal*, **87** (10), 1374-1379.

Full Text: [1997\Sou Afr Med J87, 1374.pdf](1997/Sou%20Afr%20Med%20J87,%201374.pdf)

Abstract: OBJECTIVE: To quantify the prevalence of iodine deficiency and endemic goitre in the Langkloof area.

DESIGN: A cross-sectional study.

SETTING: Four primary schools in four communities in the Langkloof.

SUBJECTS: 565 primary schoolchildren from Standard 2 to Standard 5.

OUTCOME MEASURES: Clinical diagnosis of thyroid size by palpation, level of iodine in urine and drinking water samples, level of iodine in iodised salt samples from the area, percentage of households with iodised salt on the premises, and anthropometric measures of body height and weight.

RESULTS: The prevalence of endemic goitre varied from 14.3% to 30.2% in the four communities and, based on urinary iodine levels, the iodine deficiency ranged from mild to severe. Both iodised and non-iodised salt were available at the local grocery stores but only small percentages of households had iodised salt in the house. The iodine content of drinking water was low. Anthropometric indices of undernutrition indicated medium to high levels of stunting in three of the four communities, the worst being in the community with the highest goitre prevalence.

CONCLUSIONS: Endemic goitre caused by iodine deficiency is a public health problem in the Langkloof, varying in severity from mild to severe in the different communities. The impact of mandatory iodisation of table salt, introduced at the end of, (1995), needs to be assessed in these communities.

Keywords: Disorders

# Title: Southeast Asian Journal of Tropical Medicine and Public Health

(Southeast Asian J. Trop. Med. Public Health)

Full Journal Title: [Southeast Asian Journal of Tropical Medicine and Public Health](http://www.tm.mahidol.ac.th/seameo/Journal_PreviousJournals.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Dazo, B.C., Sudomo, M., Hardjawidjaja, L., Joesoef, A. and Bardoji, A. (1976), Control of Schistosoma japonicum infection in Lindu Valley, Central Sulawesi, Indonesia. *Southeast Asian Journal of Tropical Medicine and Public Health*, **7** (2), 330-340.

Full Text: Sou Asi J Tro Med Pub Hea7, 330.pdf

Abstract: In Indonesia, schistosomiasis is presently confined to two endemic areas in Central Sulawesi, Lindu (1,500) and Napu (5,000 inhabitants) valleys. Because of various development schemes now underway, it is feared that the natural balance which existed for many years between the parasite, the snail intermediate hosts and man, will be upset and will place some 70,000 people of the adjoining Palu and Palolo areas at risk. Measures are being taken to control and prevent the spread of the disease. A pilot control programme is planned for two years in the village of Anca in Lindu with a population of 391 and a prevalence rate of 70.5%. Langko village with a population of 464 and a prevalence rate of 53.7% will be utilized as the comparison area. Baseline data on human, malacological and animal reservoir hosts are being collected and control operations are anticipated to commence in July 1975. Measures to be applied to control schistosomiasis in the order of priorities are: (a) agro-engineering or modification of the environment, (b) environmental sanitation through the provision of adequate water supply and construction of latrines, (c) mollusciciding of remaining snail infested areas, (d) chemotherapy, and (e) health education campaign. At the end of the two-year control programme, the following activities will be carried out to determine the degree of intervention achieved, (a) human data: calculation of prevalence rates, incidence rates, and changes in the intensity of infection based on quantitative egg counts, (b) malacological data: changes in the number and extent of snail foci, snail density, and snail infection rates, (c) reservoir hosts: changes in the prevalence rates among domestic and wild animals. Calculation of reclaimed areas and increase in agricultural production will also be assessed together with the overall cost/benefit analysis of the project undertaking.

? Imandel, K., Khodabandeh, A., Mesghaly, A. and Firozian, H. (1977), Epidemiology of fluorosis in the Borazjan area of Iran. I. Fluoride content in drinking water. *Southeast Asian Journal of Tropical Medicine and Public Health*, **8** (1), 87-88.

Full Text: Sou Asi J Tro Med Pub Hea8, 87.pdf

? Sekarajasekaran, I.A. (1979), Physical changes of the environment and health effects with special reference to water pollution and sanitation in Malaysia. *Southeast Asian Journal of Tropical Medicine and Public Health*, **10** (4), 634-649.

Full Text: Sou Asi J Tro Med Pub Hea10, 634.pdf

Abstract: Development of a human community are not without changes in its environment. Such changes result in either beneficial or adverse effects on human health. In Malaysia, in the wake of the New Economic Policy aimed at the redressing of the poor population and income distribution, development of the nation has brought about various changes in the environment. Some of these changes have elevated basic public health problems, while others, particularly new agricultural practices and industrialisation programmes with urbanisation trends, have brought a new set of problems due to water pollution and sanitation. Various measures are being taken to protect and to improve the environment so that progress can be realised with minimum adverse effects. This also calls for assistance from international sources, in terms of expertise, training and funds.

? Han, A.M. and Myint, T.M. (1986), Knowledge, attitudes and behaviour in relation to diarrhoea in a rural community in Burma. *Southeast Asian Journal of Tropical Medicine and Public Health*, **17** (1), 59-62.

Full Text: Sou Asi J Tro Med Pub Hea17, 59.pdf

Abstract: A study was conducted in a rural community in Burma, to determine how people perceive the importance of food, water and defecation in the causation of diarrhoea and to determine whether people wash hands or use soap after defecation or before preparing and eating food. 90% of mothers with under-five children in the community were interviewed. 53 to 86% of people were aware of the importance of food, water and defecation in the causation of diarrhoea. Although 34 to 88% practised hand washing before eating/food handling or after defecation, only 5 to 12% regularly used soap. Furthermore, drinking water for under-five children was obtained by dipping the drinking μg or cup into the drinking water pot (83%) which could result in contamination of drinking water.

? Candler, W., Phuphaisan, S., Echeverria, P., Liangthorachon, B., Bhaibulaya, M., Arthur, J., Bodhidatta, L. and Buduan, R. (1990), Amebiasis at an evacuation site on the Thai-Cambodian border. *Southeast Asian Journal of Tropical Medicine and Public Health*, **21** (4), 574-579.

Full Text: Sou Asi J Tro Med Pub Hea21, 574.pdf

Abstract: Symptomatic intestinal amebiasis was highly endemic among the Cambodians living at Green Hill, an evacuation site on the Thai-Cambodian border between June 1987 through May 1989. Monthly incidence rates of intestinal amebiasis were determined to be inversely proportional to cumulative monthly rainfall. The highest incidence of amebic dysentery was 63/1000 in children 12-23 months old. Behavioral risk factors were investigated by conducting a case-control study. A questionnaire was administered to 73 families, each having at least one member with confirmed intestinal amebiasis within the past 3 months, and to 95 randomly selected control families having no individual with diarrhea for at least 3 months. Individuals from families with greater than 4 members were at higher risk for acquiring intestinal amebiasis. No significant differences in behavioral risk factors were identified between case and control families. Eighty-six percent of 51 water samples drawn from wells where amebiasis patients obtained their drinking water had greater than 10 coliforms/100 ml. The main route of transmission of E. histolytica was not identified, but was most likely via the fecal-oral route.

? Swaddiwudhipong, W., Lerdlukanavonge, P., Khumklam, P., Koonchote, S., Nguntra, P. and Chaovakiratipong, C. (1992), A survey of knowledge, attitude and practice of the prevention of dengue hemorrhagic fever in an urban community of Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health*, **23** (2), 207-211.

Full Text: Sou Asi J Tro Med Pub Hea23, 211.pdf

Abstract: To evaluate the effect of a health education program on the prevention and control of dengue hemorrhagic fever (DHF) in the municipality of Mae Sot, Tak Province, a survey of adult residents, mainly housewives, was conducted in late April 1990 to assess their knowledge of DHF and practice of preventive methods. A total of 417 respondents from 417 households selected by a systematic-cluster sampling method were interviewed. More than 90% of them knew that the disease is transmitted by Aedes mosquitos and indicated water jars and water retention in the houses as the common breeding places. However, the other two common breeding places, ant-traps and cement baths, were less frequently mentioned. This finding was consistent with the greater proportion of respondents who reported no larval control methods for these two kinds of containers than for the others. Covering water containers was the most common practice to prevent mosquito breeding in drinking-water containers whereas addition of abate (temephos sand granules) or changing stored water frequently was commonly used for non-drinking water storage. Larval control for ant-traps was mainly accomplished by the addition of chemicals, including abate, salt, oil or detergent. Health education efforts in this area could induce the majority of respondents to accept themselves as responsible for the Aedes control program. Health education by health personnel played an important role in disseminating DHF information and prevention methods. Radio and television were the main effective mass media for public health education on DHF in this area.

? Migasena, P. and Choopanya, K. (1992), Nutrition and the environmental situation in Bangkok. *Southeast Asian Journal of Tropical Medicine and Public Health*, **23** (3), 46-53.

Full Text: Sou Asi J Tro Med Pub Hea23, 46.pdf

Abstract: Bangkok, the capital of Thailand, is a large city of about six million people. According to the rapid growth of economy, Bangkok faces to the problems of urbanization and industrialization. Non-communicable disease such as cardiovascular diseases, cancers are the leading causes of death. There is a trend of increasing air pollution in the congested areas and industrialized zones, with the increase over the ambient air quality standard involving suspended particulate matter. Other public health problems include the sanitation of restaurants, the quality of drinking water and coloring agents in food, drug addiction especially in young males. Poor hygiene in drug injection is one of the major causes of HIV transmission. AIDS, originally our imported disease, needs urgent prevention by health education and counseling. Improvements in government and non-government health care resources are still needed. A good cooperative city health plan serves a practical purpose, especially for the solution of the air and water pollution in Bangkok. However, pilot operational research on nutrition, health and environment in relation to city health planning needs to be discussed further for more effective implementation.

? Lee, H.L. and Singh, K.I. (1993), Studies on the effect of translocation of chemical insecticides in Eicchornia host plant on Mansonia mosquitos: A potential control method. *Southeast Asian Journal of Tropical Medicine and Public Health*, **24** (2), 105-109.

Full Text: Sou Asi J Tro Med Pub Hea24, 105.pdf

Abstract: A novel method for the control of Mansonia larvae was developed and tested. In this method, foliar absorption and translocation of a chemical insecticide, monocrotophos, a known systemic insecticide was studied in the Eicchornia plant. Acetone solution of the insecticide was painted onto leaves of the plant. At daily intervals, stems were severed and divided into equal sections which were introduced into bowls. Larvae of Aedes aegypti were tested for the presence of monocrotophos. It was found that translocation of the insecticide occurred at different rates in the stems and in some plants the chemical was also released into the surrounding water. Based on these results, 2 insecticides namely, monocrotophos and temephos were painted onto leaves of the host plant and their translocation to the root and water environment was examined by testing with Mansonia and Aedes aegypti larvae. The results again confirmed the translocation process and it was found that the insecticides were secreted into the surrounding water, thereby killing the larvae. However, in leaves painted with permethrin (synthetic pyrethroid) or flufenoxuron (chitin synthesis inhibitor), such a process was not detected. The potential of this new concept in Mansonia larval control is examined.

? Suthienkul, O. (1993), Bacteriophage typing of Vibrio fluvialis. *Southeast Asian Journal of Tropical Medicine and Public Health*, **24** (3), 449-454.

Full Text: Sou Asi J Tro Med Pub Hea24, 449.pdf

Abstract: Six stable bacteriophages of Vibrio fluvialis were isolated from 44 surface water specimens collected in Thailand and Japan. Twelve different phages types were found among 109 V. fluvialis isolated from feces of diarrheal patients and the environment. Seventy-three percent (80/109) of these 109 isolates were typable with these phages. One phage type, designated as A (1) was predominant and accounted for 43% of the V. fluvialis examined. The six bacteriophages used in this typing scheme were stable for at least during a three-month storage at 4°C. This proposed bacteriophage typing scheme may be of valuable aid in tracing sources and routes of infection in outbreaks of V. fluvialis infection in man.

? Luksamijarulkul, P., Pumsuwan, V. and Pungchitton, S. (1994), Microbiological quality of drinking water and using water of a Chao Phya River community, Bangkok. *Southeast Asian Journal of Tropical Medicine and Public Health*, **25** (4), 633-637.

Full Text: Sou Asi J Tro Med Pub Hea25, 633.pdf

Abstract: Safe water is essential for good health of humans. The contamination of water with infected fecal material is common in areas with poor standards of hygiene and sanitation. The determination of microbiological quality of water is essential. Simple routine testing of the bacteriological quality of drinking water is designed to detect the presence of coliform bacteria and virological assessment is to detect the presence of enteric viruses, especially hepatitis A virus (HAV). Therefore, this study attempted to determine the HAV and coliform bacteria contamination in drinking water and using water of a Chao Phya River community, Bangkok where crowded living conditions increase the risk of water-related diseases. 95 samples of drinking water and 75 samples of used water in containers were collected with sterile technique for determining HAV antigen by ELISA and coliform contamination by the Most Probable Number Technique (MPN). The results revealed that HAV and coliform contamination rates of drinking water were 25.26% and 64.21%, respectively. The rain water had the highest contamination (60.00% and 80.00%). Tap water was 23.73% for HAV (14/59 samples) and 64.41% for coliforms (38/59 samples) whereas running water had the least contamination (2.94% for HAV and 5.88% for coliforms). The contamination rates of used water were 10.69% for HAV and 68.67% for coliforms.

? Haque, Q.M., Sugiyama, A., Iwade, Y., Midorikawa, Y., Yoshimura, H., Kawsar, U., Shimada, T. and Yamauchi, T. (1996), Characterization of Aeromonas hydrophila: A comparative study of strains isolated from diarrheal feces and the environment. *Southeast Asian Journal of Tropical Medicine and Public Health*, **27** (1), 132-138.

Full Text: Sou Asi J Tro Med Pub Hea27, 132.pdf

Abstract: Thirty-five strains of Aeromonas hydrophila isolated from feces of diarrheal patients and from the environments were collected from Thailand and Japan. The physiological, biochemical, and serological characteristics, antibiotic resistance patterns and cell surface-related properties were compared. The diarrheal and environmental isolates of A hydrophila were found to be remarkably consistent in general culture and biochemical characteristics, with the exception of the reaction to D-arabinose in which the diarrheal strains were positive and environmental strains were negative. The plasmid patterns and cell surface-related properties of the environmental and diarrheal isolates were different. All strains produced Vero cell cytotoxin, hemolysin and lecithinase at 37 degrees, 30°and 15°C. In contrast, 83% of the environmental strains produced these virulence factors even at 4°C. All strains indicated almost uniform susceptibility to the 16 antibiotics tested. Variations were found in the plasmid profile, toxin production in relation to the differences of temperature and cell surface-related properties of the strains. These variations between the clinical and environmental isolates could have potential as epidemiological markers for the sources of strains.

? Hirata, M., Kuropakornpong, V., Arun, S., Sapchatura, M., Kumnurak, S., Sukpipatpanont, B., Chongsuvivatwong, V., Funahara, Y. and Sato, S. (1997), A case-control study of acute diarrheal disease among school-age children in southern Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health*, **28** (3), 18-22.

Full Text: Sou Asi J Tro Med Pub Hea28, 18.pdf

Abstract: We conducted a case-control study of school-age children in Phatthalung, a province in southern Thailand using a questionnaire to investigate associations of children’s hygiene-related behavior and hygienic conditions in their homes with acute diarrheal disease. We compared 69 acute diarrhea (less than 7 days duration) cases that attended two hospitals in Phatthalung during August 1995 to June 1996 with 69 age-, sex-and address-matched controls in primary schools who had not suffered from diarrheal disease for the past one year before August 1995. Three factors were found to be significantly associated with acute diarrheal disease: farmer or gum planter as the occupation of father [Odds ratio (OR) 6.6, 95% confidence interval (CI) 1.7-26.1, p < 0.01], installation of a refrigerator in children’s homes (OR 0.2, CI 0.1-0.8, p < 0.05), and drinking untreated water (OR 2.3, CI 0.9-6.1, p < 0.1). There was no significant difference for sources of drinking water between cases and controls. Considering the data on drinking water, the results indicated that there are some problems with quality of sources of drinking water. The results also suggested that having a refrigerator could have preventive effects on acute diarrheal disease, while inadequate behavior and unhygienic environment in the homes of farmers and gum planters might be related to acute diarrheal among school-age children.

? Pongpaew, P., Tungtrongchitr, R., Phonrat, B., Supawan, V., Schelp, F.P., Intarakhao, C., Mahaweerawat, U. and Saowakontha, S. (1998), Nutritional status of school children in an endemic area of iodine deficiency disorders (IDD) after one year of iodine supplementation. *Southeast Asian Journal of Tropical Medicine and Public Health*, **29** (1), 50-57.

Full Text: Sou Asi J Tro Med Pub Hea29, 50.pdf

Abstract: To improve the health and nutritional status of school children in an area of iodine deficiency disorders (IDD) by means of different iodine fortifications in salt, fish sauce and drinking water, anthropometric assessment for nutritional measurement, including hematological status, were performed. There was a significant difference in the weight and height of the children from the four schools investigated, before and after supplementation in each school. The prevalence of anemia (as indicated by hematological measurement) and iodine deficiency (as indicated by urinary iodine concentration in the children from the four schools) were assessed and compared before and after iodine supplementation, a decrease in prevalence was found in all school children, however, serum ferritin did not change before and after supplementation.

? Prakash, C. (1998), Serological diagnosis of jaundice epidemics in India. *Southeast Asian Journal of Tropical Medicine and Public Health*, **29** (3), 497-502.

Full Text: Sou Asi J Tro Med Pub Hea29, 497.pdf

Abstract: Enterically transmitted non-A, nonB-hepatitis (ET-NANBH) is a major public health problem in India, where the endemicity of this disease is high and poor public sanitation coupled with compromised quality of drinking water leads to major and minor outbreaks. Sophisticated technics for characterization of hepatitis E virus (HEV) are not easily available/affordable, resulting in continuation of the diagnosis of NANBH for most epidemics. This study attempts to serologically determine the etiology of epidemics of NANBH in India. Eighteen outbreaks of jaundice occurring in various regions of India over a period of twenty months were selected for this laboratory based study. Representative cases of each outbreak were subjected to detailed serological investigation for immunological markers of viral hepatitis. Each serum sample was tested for the immunological markers of acute or recent infection with hepatitis A or B viruses (anti-HAV-IgM, HBsAg and anti-HBc-IgM) by Macro ELISA (Abbott).The sera found to be negative for these three markers ie non-A, non-B hepatitis (NANBH) sera were further tested for anti-HEV by Macro ELISA (anti-HEV EIA, Abbott). A highly significant number of NANBH sera were reactive for anti-HEV in case of almost all the outbreaks. The lowest figure for anti-HEV positivity in NANBH sera of outbreak was compared with anti-HEV positivity in the controls and found to be significantly high. It was concluded that anti-HEV is an important marker revealing probability of the NANBH outbreak being due to HEV.

? Sherchand, J.B., Cross, J.H., Jimba, M., Sherchand, S. and Shrestha, M.P. (1999), Study of Cyclospora cayetanensis in health care facilities, sewage water and green leafy vegetables in Nepal. *Southeast Asian Journal of Tropical Medicine and Public Health*, **30** (1), 58-63.

Full Text: Sou Asi J Tro Med Pub Hea30, 58.pdf

Abstract: Cyclospora cayetanensis, a newly emerging parasite, is endemic in Nepal. A total of 2, 123 stool specimens were collected from 3 health care facilities based on clinical symptoms during the period between, (1995), to October, (1998). Out of these specimens, cayetanensis oocysts were found in 632 (29.8%). To identify possible sources for Cyclospora infection, drinking water, sewage water, green-leafy vegetables including fecal samples of various animals were collected and examined. The vegetable leaves were washed in distilled water then the washings, sewage water and drinking water were centrifuged and the sediment were examined microscopically. As a result, oocyst of Cyclospora were identified in sewage water and vegetable washings on four different occasions in June, August, October and November. The positive results were also confirmed as C. cayetanensis by development of 2 sporocysts after 2 week incubation period in potassium dichromate. A survey of 196 domestic animals from the same areas demonstrated that two chickens were positive for Cyclospora-like organism and others were negative. Although further studies are needed to clarify the direct link between Cyclospora infection and these sources, the results suggest that sewage water, green leafy vegetables are possible sources of infection and chickens could be possible reservoir host of Cyclospora in Nepal.

? Xu, X.J., Yang, X.X., Dai, Y.H., Yu, G.Y., Chen, L.Y. and Su, Z.M. (1999), Impact of environmental change and schistosomiasis transmission in the middle reaches of the Yangtze River following the Three Gorges construction project. *Southeast Asian Journal of Tropical Medicine and Public Health*, **30** (3), 549-555.

Full Text: Sou Asi J Tro Med Pub Hea30, 549.pdf

Abstract: With the construction of the Three Gorges high dam on the Yangtze River in China in mind, a serious of ecological environmental factors that might affect the transmission of Schistosoma japonicum in Jian Han Plain were investigated by means of data collection, field surveys and observation in Hubei Province. Several ecological factors including water level of the Yangtze River, riparian water table, annual rainfall and yearly evaporation were investigated in relation to the prevalence of schistosomiasis. The results suggest that after the dam construction, middle water level flows (ie between flood flows and dry-weather flows) will persist in the flood season due to a rise in the water table. The investigation indicated that snail distribution and human schistosomiasis prevalence differed significantly between years which had typically high, middle and low typical water levels in the Yangzte. Moreover, the prevalence of the disease showed a significant linear regression relationship with density of snail intermediate hosts, water table, annual rainfall, yearly evaporation and ground altitude in the survey area. Systematic and careful monitoring and surveillance is necessary to investigate the impact of the environmental changes brought about by the dam construction on schistosomiasis transmission.

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Full Text: [2007\Sou Asi J Tro Med Pub Hea38, 325.pdf](2007/Sou%20Asi%20J%20Tro%20Med%20Pub%20Hea38,%20325.pdf)

Abstract: The objective of this study was to assess the trends of sampling locations and methods of studying hard-to-reach populations conducted in Japan. We accessed a Japanese medical database on 30 September 2005 to review 5 study types of hard-to-reach populations conducted in Japan: men who have sex with men, homeless, sex workers, undocumented migrants, and injecting drug users. We then categorized their sampling locations and methods. We found 298 articles on hard-to-reach populations published from 1983 to September 2005. Of the 285 studies sampled, approximately 92% were facility-based studies and the rest were community-based. This tendency was consistent in each subgroup, the majority of the studies were conducted among patients in medical facilities. Our study shows the majority of studies on hard-to-reach populations in Japan adopted a convenience sampling method and were facility-based. We suggest the utilization of comparatively valid techniques, such as time-location or respondent driven sampling to more clearly understand these populations.

Keywords: Community Based, Database, Drug, Facilities, Japan, Medical, Men, Methods, Migrants, Patients, Populations, Review, Sampling, Sex, Sex Workers, Techniques, Trends, Utilization

# Title: Southern Economic Journal

Full Journal Title: [Southern Economic Journal](http://www.jstor.org/action/showPublication?journalCode=souteconj)

ISO Abbreviated Title:

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Issues/Year:

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? Lee, M.L., Liu, B.C. and Wang, P. (1994), Growth and equity with endogenous human capital: Taiwan’s economic miracle revisited. *Southern Economic Journal*, **61** (2), 435-444.

Full Text: [1994\Sou Eco J61, 435.pdf](1994/Sou%20Eco%20J61,%20435.pdf)

? Joseph, K., Laband, D.N. and Patil, V. (2005), Author order and research quality. *Southern Economic Journal*, **71** (3), 545-555.

Full Text: [2005\Sou Eco J71, 545.pdf](2005/Sou%20Eco%20J71,%20545.pdf)

Abstract: We observe a great deal of heterogeneity in the manner in which author orderings are assigned both across and within academic markets. To better understand this phenomenon, we develop and analyze a stochastic model of author orderings. In our model, authors work equally hard to obtain priority in listings but final contributions are stochastic. Further, research outlets differ in their quality hurdles. In this setting, our simulation results are consistent with two empirical regularities. First, we find that the rate of alphabetization increases with the stringency with which papers are accepted for publication. Second, conditional on clearing the publication hurdle, quality increases with alphabetization. These findings arise because increases in the publication hurdle make it more likely that authors will exceed this threshold only when both contribute a high amount. This, in turn, leads to roughly equal contributions (alphabetization) and also generates a positive correlation between alphabetization and quality.

Keywords: Author, Publication, Research

# Title: Southern Medical Journal

Full Journal Title: [Southern Medical Journal](http://weblinks2.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+aphjnh+bt+TD++%22SOU%22+88A3&_ug=sid+CC4B6280%2D815A%2D4D1A%2DA53E%2DED3336FE8289%40sessionmgr2+dbs+aph+AEA6&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%22SOU%22+tg%5B0+%2D+db%5B0+%2Daph+op%5B0+%2D+h), [Southern Medical Journal](http://gateway.ut.ovid.com/gw1/ovidweb.cgi?QS2=434f4e1a73d37e8c8a96d3ba1aa0ba0d5b53d5e5632d1549f031c17cf6daf6e5e6fd643fcc2c191931dc05788dd555e0d0bf2e1013c9845c449a49ac36f33a0fe68bc326344a2f8fec66bf94b2303492df8a9c87e0a11a4c5068ff87d36252512d8d0048415dda578)

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Journal Country United States

Language: English

Publisher: Southern Medical Assn

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? Cech, I., Holguin, A., Sokolow, H. and Smith, V. (1984), Selenium availability in Texas: Possible clinical-significance. *Southern Medical Journal*, **77** (11), 1415-1420.

Full Text: [1984\Sou Med J77, 1415.pdf](1984/Sou%20Med%20J77,%201415.pdf)

Abstract: In light of recent reports that have indicated that selenium is an essential micronutrient and possible natural cancer inhibitor, data on the geographic distributions of selenium in Texas were gathered and compared with the distribution of age-adjusted cancer mortality rates. We considered concentrations of selenium measured in ground and surface water to be indicators of its presence in rocks, soil, and locally grown crops. Texas water sources were found to be poor in selenium, except for the Panhandle and the West Texas regions, where soil consists of erosion products from the selenium-rich Rocky Mountains. In general, lower cancer mortality was observed for the selenium-rich regions of Texas compared with cancer mortality for the selenium-poor regions. Even though the risks from cancer-provoking factors also differed geographically, the observed pattern was sufficiently suggestive to warrant further attention to selenium. (C) 1984 Southern Medical Association

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Full Text: [1986\Sou Med J79, 1156.pdf](1986/Sou%20Med%20J79,%201156.pdf)

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Full Text: [1987\Sou Med J80, 421.pdf](1987/Sou%20Med%20J80,%20421.pdf)

Abstract: I retrospectively describe 20 episodes of water intoxication in 19 infants, with hypothermia, seizures, and hyponatremia. Overdilution of formula or aggressive supplementation with water or clear juices were documented in 16 of the 20 episodes. Seizures and respiratory distress were severe enough in six cases to require intubation and ventilatory support. Marked diaphoresis was noted as a premonitory symptom to seizures in eight children. The children were an average of 5.1±4.3 months of age, serum sodium values averaged 118±4.3 mmol/L. No evidence of excess production of antidiuretic hormone was found. Water intoxication in infants is common, and I discuss its possible relationship to demyelinating disease of the central nervous system. (C) 1987 Southern Medical Association

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Full Text: [1989\Sou Med J82, 814.pdf](1989/Sou%20Med%20J82,%20814.pdf)

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Full Text: [1992\Sou Med J85, 1053.pdf](1992/Sou%20Med%20J85,%201053.pdf)

Abstract: With the epidemic of cholera in South and Central America and reports of cholera in the Northern Hemisphere in Mexico, increasing concern focuses on sanitation problems along the border between the United States and Mexico. It is feared that binationally shared water supplies are threatened or contaminated by sewage and other wastes. Although much anecdotal information exists, surprisingly few hard data are available in the United States (or in Mexico, for that matter) regarding water quality on the Mexican side of the border. This shortage of data is felt most acutely in the semiarid portions of the border, where water is extraordinarily scarce. In, (1987), researchers at the University of Texas School of Public Health (UTSPH) began gathering data on the availability, accessibility, and bacteriologic and chemical safety of raw and finished drinking water in Mexico at its border with Texas. In view of their timely significance, we wish to share pertinent data. This particular study was carried out in Ciudad Juarez, a city of more than 1 million people, situated just across the Rio Grande from the Texas city of El Paso. The investigation was conducted at the invitation and with the assistance of municipal authorities of Cd. Juarez. As far as we know, this was the first time the water in Cd. Juarez had been tested for indicator fecal bacteria and other selected contaminants.

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Full Text: [2007\Sou Med J100, 371.pdf](2007/Sou%20Med%20J100,%20371.pdf)

Abstract: Introduction: The emphasis on publications for promotion in academic medicine would lead one to the theory that authorship numbers would increase proportionally with this emphasis. To investigate authorship trends across a number of periodicals, we performed a descriptive study comparing two full years of published articles spaced ten years apart from five medical journals. Methods: Physician reviewers each reviewed all articles of one medical journal for the 1995 and 2005 publication years. Reviewed journals included Academic Emergency Medicine (AEM), Annals of Emergency Medicine (AnnEM), Annals of Internal Medicine (AIM), Journal of Trauma (JT), and New England Journal of Medicine (NEJM). Data collected for each article were number of authors, ordinal number of the corresponding author, type of study described, whether the described study was a multicenter trial, whether authorship listed included a “study group,” and whether any author was also an editor of the journal. Results: A total of 2927 articles were published in the five journals in 1995, and of these, 1401 (47.9%) were analyzed after the exclusion criteria had been applied, for 2005 a total of 3630 articles were published and of these, 1351 (37.2%) were included in the analysis. Across all five journals the mean number of authors per article increased from 4.66 to 5.73 between 1995 and 2005 (P < 0.0001), and four of the five journals individually had statistically significant increases in the number of authors per article. More articles had a journal editor as an author in 2005 (increased from 7.8% to 11.0%, P = 0.004), though no single journal had a statistically significant increase. Conclusion: We describe a trend of increasing mean authors, editorial authorship, study groups, and multicenter trials over time with fewer solo authors now publishing original research or case reports. The academic medical community must pursue an authorship requirement consensus to assure that a standard of contribution for all authors on a given paper is met.

Keywords: Analysis, Authorship, Case Reports, Community, Consensus, Criteria, England, Journal, Journals, Lead, Medical, Medical Journals, Medicine, P, Periodicals, Promotion, Publication, Publications, Publishing, Requirement, Research, Standard, Theory, Trend, Trends, Trial

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? Vyaertniu, M.G., Petyarv, E.K. and Palm, U.V. (1975), Isotherm for rubidium ion adsorption on bismuth from methanolic solutions of constant ionic-strength. *Soviet Electrochemistry*, **11** (3), 449-451.

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Tyurin, Y.M., Chumakov, I.V., Tikhomirov, A.V., Tomilov, A.P. and Smirnova, L.A. (1991), Acrylonitrile adsorption and electroreduction at cadmium in potassium hydrogen phosphate solutions. *Soviet Electrochemistry*, **27** (4), 406-411.

Abstract: Voltammetry, chronopotentiometry, differential-capacitance and Rehbinder hardness measurements were used to investigate the kinetics of acrylonitrile electroreduction and the adsorption of acrylonitrile at cadmium in 0.005 to 0.05 M K2HPO4. An irreversible reduction peak of diffusional origin and a corresponding potential arrest were found. The kinetic parameters were calculated. It was shown that acrylonitrile adsorption is satisfactorily described by the Frumkin isotherm. Certain adsorption parameters as well as the degree of coverage of the electrode surface in the electroreduction region were estimated. The results were compared with literature data for the mercury electrode, and analyzed along the lines of approach developed for describing the kinetics of electroreduction of organic substances in the adsorbed state.

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Full Journal Title: Soviet Geography Review and Translation

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Harris, C.D. (1980), Most-cited geographical serials on Soviet-Union. *Soviet Geography Review and Translation*, **21** (9), 615-616.

Keywords: Serials

# Title: Soviet Physics Crystallography, USSR

Full Journal Title: Soviet Physics Crystallography, USSR

ISO Abbreviated Title:

JCR Abbreviated Title: Sov Phys-Cryst Engl Transl

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Dukova, E.D. and Gavrilen, E.V. (1970), Morphology and surface kinetics of growth of beta- methylnaphthalene from alcohol solution - an intermediate adsorption film of melt. *Soviet Physics Crystallography, USSR*, **14** (5), 736-??.

? Chernov, A.A. Kuznetso, V.A. (1970), Kinetics of hydrothermal crystallization of quartz in different solutions and adsorption film hypothesis. *Soviet Physics Crystallography, USSR*, **14** (5), 753-??.

# Title: Soviet Physics-Solid State

Full Journal Title: Soviet Physics-Solid State

ISO Abbreviated Title:

JCR Abbreviated Title: Sov Phys-Solid State-Engl Tr

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zingerman, Y.P. and Morozovskii, V.A. (1961), Ionization method for studing the kinetics of adsorption processes on the surfaces of solid bodies. *Soviet Physics-Solid State*, **3** (1), 88-94.

# Title: Soviet Physics-Technical Physics

Full Journal Title: Soviet Physics-Technical Physics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liashenko, V.I. and Litovchenko, V.G. (1958), Effect of adsorption of molecules on the work function and the conductivity of germanium. 2. Kinetics of the process. *Soviet Physics-Technical Physics*, **3** (3), 429-433.

# Title: Soviet Soil Science

Full Journal Title: Soviet Soil Science

ISO Abbreviated Title:

JCR Abbreviated Title: Sov Soil Sci

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Pakshina, S.M. and Petukhov, V.R. (1974), Effect of diffuse double ion layer on kinetics of exchange adsorption of cations in soil. *Soviet Soil Science*, **6** (5), 586-592.

# Title: Soviet Soil Science-USSR

Full Journal Title: Soviet Soil Science-USSR

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

IDS Number: D9004

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Turnas, P.A. (1965), Use of peat soils in drained bogs in agriculture and forestry (according to material presented at international congress on peat Leningrad 1963). *Soviet Soil Science-USSR*, **4**, 436-??.

? Galaktio, A.A. (1968), Role of individual organic components of peat in adsorption of ammonia. *Soviet Soil Science-USSR*, **12**, 1636-??.

# Title: Sozial-und Präventivmedizin/Social and Preventive Medicine

Full Journal Title: [Sozial-und Praventivmedizin](http://springerlink.metapress.com/(b2dzlfnhcdmr3nmut5fg3tib)/app/home/journal.asp?referrer=parent&backto=linkingpublicationresults,1:109374,1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0303-8408

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Stellman, S.D. (2003), Issues of causality in the history of occupational epidemiology. *Sozial-und Präventivmedizin*, **48** (3), 151-160.

Full Text: [S\Soz Pra48, 151.pdf](S/Soz%20Pra48,%20151.pdf)

Abstract: Occupational epidemiology has its roots in classical medicine. However, it became a quantitative discipline only in the 20th, century, through the pioneering work of individuals such as Case, Lloyd, and Selikoff and organizations such as the Division of Occupational Health of the U.S. Public Health Service. Studies of chemical dye workers, bituminous coal miners, smelting workers, and uranium miners have been especially important sources of innovations in methodology and in development of logical reasoning leading to acceptance of causal relationships of occupational exposures that lead to respiratory diseases and cancer. The cooperation of labor unions, such as those of steel and asbestos workers, has often been a crucial factor in providing essential data.

Keywords: Occupation, Epidemiology, History, Causality, Epidemiologic Method, Asbestos-Exposure, Cancer Mortality, Uranium Miners, United-States, Patterns, Workers, Vietnam

Decker, O., Beutel, M.E. and Brähler, E. (2004), Deep impact: Evaluation in the sciences. *Sozial-und Präventivmedizin*, **49** (1), 10-14.

Full Text: [S\Soz Pra49, 10.pdf](S/Soz%20Pra49,%2010.pdf)

Abstract: The purpose of the paper is to evaluate the psychometric properties of the impact factor as an assessment procedure. Detailed criteria regarding theoretical underpinnings, test administration, scoring and interpretation are applied. The impact factor appears to be of limited use for deciding which journals to subscribe. It is not suitable for evaluating achievements of individual scientists and research groups. The impact factor contains serious sources of errors and flaws resulting in strong biases against culture- and language-bound medical subspecialties and non-Anglo-American countries. Possible alternatives are discussed.

Prof. Dr. Elmar Brähler is the director of the Department of Medical Psychology and Medical Sociology, University Medial School in Leipzig. Dr. Manfred Beutel is a professor of the Department of Psychosomatic and Psychotherapy, University Medical School in Gießen. Dr. Oliver Decker is an assistant at the Department of Medical Psychology and Medical Sociology, University Medical School in Leipzig

Porta, M., Fernandez, E., Murillo, J., Alguacil, J. and Copete, J.L. (2004), Commentary I - The bibliographic ‘impact factor’, the total number of citations and related bibliometric indicators: The need to focus on journals of public health and preventive medicine. *Sozial-und Präventivmedizin*, **49** (1), 15-18.

Full Text: [2004\Soz Pra49, 15.pdf](2004/Soz%20Pra49,%2015.pdf)

Keywords: Frequency, Institute, Quality, Science

? Zwahlen, M., Junker, C. and Egger, M. (2004), Commentary II - The journal impact factor in the evaluation of research quality: Villain, scapegoat or innocent bystander? *Sozial-und Präventivmedizin*, **49** (1), 19-22.

Full Text: [2004\Soz Pra49, 19.pdf](2004/Soz%20Pra49,%2019.pdf)

Keywords: Indicators, Science

Kaltenborn, K.F. (2004), Commentary III - Validity and fairness of the impact factor - a comment on the article by Decker et al. *Sozial-und Präventivmedizin*, **49** (1), 23-24.

Full Text: [2004\Soz Pra49, 23.pdf](2004/Soz%20Pra49,%2023.pdf)

Keywords: Journals

von Troschke, J. and Stossel, U. (2004), Commentary IV - New horizons for impact discussions needed. *Sozial-und Präventivmedizin*, **49** (1), 25-26.

Full Text: [2004\Soz Pra49, 25.pdf](2004/Soz%20Pra49,%2025.pdf)

# Title: Spanish Economic Review

Full Journal Title: [Spanish Economic Review](http://www.springerlink.com/app/home/journal.asp?wasp=828064de671b4578961aa0c6b1df9e83&referrer=parent&backto=linkingpublicationresults,1:103083,1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1435-5469 (Paper) 1435-5477 (Online)

Issues/Year:

Journal Country/Territory:

Language:

Publisher: [Springer-Verlag Heidelberg](http://www.springerlink.com/app/home/main.asp?wasp=cmw7ypruqk7vneg2dr2p)

Publisher Address:

Subject Categories:

: Impact Factor

Dolado, J.J., García-Romero, A. and Zamarro, G. (2003), Publishing performance in economics: Spanish rankings (1990-1999). *Spanish Economic Review*, **5** (2), 85-100.

Full Text: [S\Spa Eco Rev5, 85.pdf](S/Spa%20Eco%20Rev5,%2085.pdf)

Abstract: This paper contributes to the growing literature that analyses the Spanish publishing performance in Economics throughout the 1990s. Several bibliometric indicators are used in order to provide Spanish rankings (of both institutions and individual authors) based on Econlit journals. Further, lists of the ten most influential authors and articles over that period, in terms of citations, are reported.

? Rodriguez, D. (2006), Publishing performance of Spanish academics: 1970-2004. *Spanish Economic Review*, **8** (4), 255-270.

Full Text: [2006\Spa Eco Rev8, 255.pdf](2006/Spa%20Eco%20Rev8,%20255.pdf)

Abstract: This work complements some of the results appearing in the article ‘Publishing Performance in Economics: Spanish Rankings’ by Dolado et al. (Span Econ Rev 5:80-103, 2003) Specifically we focus on the robustness of the results regardless of the time span considered, the effect of the choice of a particular database on the final results, and the effects on changes in the unit of institutional measure (departments vs. institutions as a whole). Differences are significant when we expand the time period considered. There are also significant but small differences if we combine datasets to derive the rankings. Finally, department rankings offer a more precise picture of the situation of the Spanish academics, although results do not differ substantially from those obtained when overall institutions are considered.

Keywords: Bibliometric Indicators, DEC, Economics, Effects, Institutions, Performance, Rankings, Robustness, Spanish Academics

# Title: Spanish Journal of Agricultural Research

Full Journal Title: Spanish Journal of Agricultural Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Arcas, N., Alcon, F., Gomez-Limon, J.A. and de Miguel, M.D. (2010), Review. The evolution of research regarding the economics of irrigation water. *Spanish Journal of Agricultural Research*, **8** (S2), S172-S186.

Full Text: [2010\Spa J Agr Res8, S172.pdf](2010/Spa%20J%20Agr%20Res8,%20S172.pdf)

Abstract: This work analyses the main research trends (subjects, methodology used, countries of the authors and data) in the economics of irrigation water during the last 10 years (2000-2009). For this purpose, a quantitative methodology has been used which is new to this sphere, based on the review of a representative sample of 332 papers published in the 15 most important journals focused on this field of science indexed in the databases of the Institute for Scientific Information (ISI), the Science Citation Index (SCI) and the Social Science Citation Index (SCCI). The results obtained confirm: a) the notable growth in the number of papers published, especially in the last three years, b) the high degree of collaboration between authors, including those of different origin, for their performance c) the prominence of the USA, Australia, India and Spain as the countries of the first authors and origin of the data, d) the greater attention given to subjects related with “investment project analysis”, “production planning” and, especially, “production function and productivity of water”, and e) the predominance of empirical studies that use basic analysis approaches (cost analysis, investment evaluation, etc.).

Keywords: Analysis, Australia, Citation, Climate, Cost, Databases, Evaluation, Evolution, Field, Growth, India, ISI, Journals, Literature Review, Quantitative Approach, Research, Research Methods, Research Trends, SCI, Science, Science Citation Index, Spain, Subject Areas, Trends, USA, Water

# Title: Spanish Journal of Psychology

Full Journal Title: [Spanish Journal of Psychology](http://www.ucm.es/info/Psi/docs/journal/)

ISO Abbreviated Title:

JCR Abbreviated Title: Span J Psychol

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Igoa, J.M. (2001), The decade 1989-1998 in Spanish psychology: An analysis of research in basic psychological processes, history of psychology, and other related topics. *Spanish Journal of Psychology*, **4** (2), 123-150.

Full Text: [2001\Spa J Psy4, 123.pdf](2001/Spa%20J%20Psy4,%20123.pdf)

Abstract: This article presents a review of research published by Spanish Faculty from the area of basic psychology in the decade 1989-1998. It provides information about research on basic psychological processes commonly studied under the labels of experimental and cognitive psychology, plus a number of topics from other research areas, including some applied psychology issues. The review analyzes the work of 241 faculty members from 27 different Spanish universities, as reflected in 1,882 published papers, book chapters, and books. The analyses carried out in this report include a description of the main research trends found in each area, with some representative references of the published materials, and statistics showing the distribution of this research work in various relevant publications (both Spanish and foreign), with figures that reveal the impact of this work both at a national and international scale.

Keywords: Analyses, Analysis, Distribution, Experimental, Faculty, History, History of Psychology, Impact, Information, International, Papers, Psychology, Publications, Research, Research Work, Review, Scale, Statistics, Trends, Universities, Work

? Sanz, J. (2001), The decade 1989-1998 in Spanish psychology: An analysis of research in personality, assessment, and psychological treatment (clinical and health psychology). *Spanish Journal of Psychology*, **4** (2), 151-181.

Full Text: [2001\Spa J Psy4, 151.pdf](2001/Spa%20J%20Psy4,%20151.pdf)

Abstract: The aim of this study is to analyze Spanish research published between 1989 and 1998 in clinical psychology and its most directly related psychological disciplines: personality psychology, psychopathology, differential psychology, health psychology, and psychological assessment. A search was performed in the various databases of the works published in that decade by Spanish university professors who investigate in these areas. Their localization was verified by direct correspondence with the professors, to whom was also sent a questionnaire to evaluate their research field and preferred theoretical approach. The 2,079 works located allowed me to identify 85 different research trends. These research trends are characterized by the predominance of applied studies over basic studies, of empirical research over theoretical research, and of the cognitive-behavioral approach over the rest of the theoretical orientations. In addition, various bibliometrical indicators of production, dissemination, and impact were calculated. They revealed that productivity and dissemination of Spanish research in these areas grew considerably during this 1989-98 period.

Keywords: Analysis, Approach, Assessment, Clinical, Clinical Psychology, Databases, Field, Health, Impact, Indicators, Personality, Personality Psychology, Productivity, Psychological Assessment, Psychological Treatment, Psychology, Questionnaire, Research, Treatment, Trends, University

? Sánchez-Miguel, E. and García-Sánchez, J.N. (2001), The decade 1989-1998 in Spanish psychology: An analysis of research in development and educational psychology. *Spanish Journal of Psychology*, **4** (2), 182-202.

Full Text: [2001\Spa J Psy4, 182.pdf](2001/Spa%20J%20Psy4,%20182.pdf)

Abstract: In this study, we identified 67 research trends that meet the criteria of this special issue. In the following pages, all the research trends will be reviewed, grouped into five categories: personal and social development, cognitive and linguistic development, developmental and educational contexts, cognition and instruction, and development and learning disabilities. A general overview of the area is obtained by dividing each category into subcategories, thus arranging the identified research trends in a four-level hierarchical structure. Taking into account this analysis, in our Conclusions section, we note the regularities with regard to the issues that have been studied the most, the predominant type of works, and, more important, the most noteworthy imbalances. We reached six conclusions: (1) Research on educational changes predominates over the study of developmental changes, (2) the study of formal education is predominant over informal education, (3) cognitive-linguistic aspects predominate over personal and social aspects, (4) application of knowledge predominates over the generation of new knowledge, (5) new educational-practice proposals predominate over the study of these educational practices, and (6) the study of change is not related to the proposals that promote change.

Keywords: Analysis, Application, Changes, Cognition, Criteria, Development, Education, Educational Psychology, General, Generation, Hierarchical Structure, Instruction, Knowledge, Learning, Practices, Psychology, Research, Social, Structure, Trends

? Blanco, A. and de la Corte, L. (2001), The decade 1989-1998 in Spanish psychology: an analysis of research in social psychology. *Spanish Journal of Psychology*, **4** (2), 203-218.

Full Text: [2001\Spa J Psy4, 203.pdf](2001/Spa%20J%20Psy4,%20203.pdf)

Abstract: In this study, a detailed exploration is carried out of the production of research and theory in social psychology in the Spanish context. The main research areas are: Work and organizational psychology, social health psychology, community and social services psychology, environmental research, judicial and political psychology, psychosocial theory and meta-theory, social psychology of language, research on emotion, group processes and social identity. The growing importance of social psychology within the framework of Spanish psychology is emphasized, and the relation with specific social problems from the national context, and the paradoxically scarce originality of the theoretical perspectives and the leading research, strongly influenced by Anglo Saxon social psychology, is commented upon.

Keywords: Analysis, Community, Context, Environmental, Environmental Research, Framework, Health, Organizational, Psychology, Psychosocial, Research, Services, Social, Theory

? Herreros de Tejada, P. and Munoz Tedo, C. (2001), The decade 1989-1998 in Spanish psychology: An analysis of research in psychobiology. *Spanish Journal of Psychology*, **4** (2), 219-236.

Full Text: [2001\Spa J Psy4, 219.pdf](2001/Spa%20J%20Psy4,%20219.pdf)

Abstract: In this paper, we present an analysis of the research published during the 1989-1998 decade by tenured Spanish faculty members from the area of psychobiology. Database search and direct correspondence with the 110 faculty members rendered a list of 904 psychobiological papers. Classification and analysis of these papers led to the definition of at least 70 different research trends. Topics are grouped into several specific research areas: Learning and Memory, Development and Neural Plasticity, Emotion and Stress, Ethology, Neuropsychology, Sensory Processing, and Psychopharmacology. The international dissemination of this research, published in journals of high impact index, and the increasing number of papers are two noteworthy features.

Keywords: Analysis, Faculty, Impact, Impact Index, Index, International, Journals, Papers, Psychology, Research, Trends

? Íñiguez-Rueda, L., Martínez-Martínez, L.M., Muñoz-Justicia, J.M., Peñaranda-Cólera, M.C., Sahagún-Padilla, M.A. and Alvarado, J.G. (2008), The mapping of Spanish social psychology through its conferences: A bibliornetric perspective. *Spanish Journal of Psychology*, **11** (1), 137-158.

Full Text: [2008\Spa J Psy11, 137.pdf](2008/Spa%20J%20Psy11,%20137.pdf)

Abstract: This study of papers gathered from the proceedings presented at Spanish social psychology conferences explores the use of bibliometrics for studying scientific disciplines. A reference database of all the papers included in the conference proceedings of events held from 1983 to 2000 was generated and classified by thematic area, paper type and author institutional affiliation. The references were laid out on contingency tables and mapped with correspondence analysis. The results show that there is a growing number of co-authored papers and a predominance of empirical over theoretical paper types. Some institutions have a higher concentration of theoretical papers while others work mostly in the areas of organizational and health psychology. In terms of empirical papers, there is a tendency towards generating more qualitative-based studies over the span of time captured by this work. There are also a number of papers written about such areas as cultural psychology that points to the emergence of an interest in critical social psychology. Concluding remarks underline the role of conferences and scientific meetings as an important indicator of the dynamic development of a scientific discipline.

Keywords: Affiliation, Analysis, Bibliometrics, Bibliometrics, Conference Proceedings, Conferences, Correspondence Analysis, Database, Development, Emergence, Health, Health Psychology, Mapping, Papers, Reference, Spanish, Spanish Social Psychology, Subject Areas, Types of Studies

? García-Pérez, M.A. (2009), The Hirsch *h* Index in a non-mainstream area: Methodology of the behavioral sciences in Spain. *Spanish Journal of Psychology*, **12** (2), 833-849.

Full Text: [2009\Spa J Psy12, 833.pdf](2009/Spa%20J%20Psy12,%20833.pdf)

Abstract: The h index has advantages over journal impact factors for assessing the research performance of individuals, and it is becoming a reference tool for career assessment that is starting to be considered by some agencies as an aid in decisions for promotion, allocation, and funding. The h index has been reported to have adequate properties as a measure of the research accomplishments of individuals in areas where h values are usually high (i.e., at or above 40), but some concerns have been raised that its validity in other non-mainstream research areas is suspect. This paper presents data from an exhaustive computation and analysis of h indices for 204 faculty members in the area of Methodology of the Behavioral Sciences in Spain, an area where h indices tend to be low worldwide. The results indicate that the h index is substantially increased by self-citations and that the average h of full professors is not meaningfully larger than the average h of associate professors. Other interesting relations between h indices and demographic and academic variables are described, including the gender and age bias of h. In this field, but perhaps also in other fields where the average h is low, little justification is found for the use of the h index as a fair measure of research performance that can aid in funding or promotion decisions.

Keywords: Bibliometric Indicators, Chi-Square, Citation Analysis, h Index, Hirsch Index, Impact-Factors, Indicators, Journals, Psychology, Scientists, Self-Citations, Tests

? Portillo-Salido, E.F. (2010), A bibliometric analysis of research in psychopharmacology by psychology departments (1987-2007). *Spanish Journal of Psychology*, **13** (1), 503-515.

Full Text: [2010\Spa J Psy13, 503.pdf](2010/Spa%20J%20Psy13,%20503.pdf)

Abstract: From the very outset of scientific Psychology, psychologists have shown interest for drugs and their effects on behavior. This has given rise to numerous contributions, mostly in the form of Psychopharmacology publications. The aim of this study was to quantitatively evaluate these contributions and compare them with other academic disciplines related to Psychopharmacology. Using the PubMed database, we retrieved information about articles from 15 journals included in the Pharmacology and Pharmacy category of the Journal Citation Reports database for a 21-year period (1987 to 2007). There were 37540 articles which about 52% were represented by 3 journals. About 70% of psychology publications were represented by 2 of these journals. Psychology departments accounted for the 11% of the published papers, which places Psychology third behind Psychiatry and Pharmacology, which contributed to 22.69 and 13% respectively. Psychology contributed to the greatest number of studies in 3 journals, second in 3 and third in 8. This report represents the first effort to explore the contribution of academic Psychology to the multidisciplinary science of psychopharmacology. Although leaders of production of psychopharmacology research were from Psychiatry and Pharmacology, Psychology departments are an important source of studies and thus of knowledge in the field of Psychopharmacology.

Keywords: Anesthetic Drug, Articles, Behavioral Pharmacology, Bibliometric, Bibliometric Analysis, Bibliometric Study, Chlorpromazine, Citation, Contribution, Database, Efficiency, European-Union, Induced Seizures, Journal Citation Reports, Journals, Knowledge, Maze-Trained Rats, Multidisciplinary, Normal Males, Pharmacology, Phenothiazine Compounds, Psychiatry, Psychology, Psychopharmacology, Publications, Research, Science, Scientific Journals, White-Rats

# Title: Special Publications-Chemical Society

Title: Special Publications-Royal Societyof Chemistry (*Spec. Publ. Chem. Soc.*)

Sillén, L.G. and Martell, A.E. (1964), ‘Stability constants of metal-ion complexes’. *Special Publications-Chemical Society*. No. **17**.

# Title: Special Libraries

Full Journal Title: [Special Libraries](http://infotrac.galegroup.com/itw/infomark/1/1/1/purl=rc18_GBIM_0__jn+%22Special+Libraries%22?sw_aep=jrycal5)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0038-6723

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Piskur, M.M. (1956), Scientific serials - Characteristics and lists of most cited publications in mathematics, physics, chemistry, geology, physiology, botany, zoology, and entomology - Brown, CH. *Special Libraries*, **47** (10), 470.

Keywords: Characteristics, Chemistry, Mathematics, Physics, Publications, Serials

? Bloomfield, M. (1966), Simulated machine indexing. Part 2. Use of words from title and abstract for matching thesauri headings. *Special Libraries*, **57** (4), 232-235.

? Donati, R. (1977), Selective survey of online access to social-science data-bases. *Special Libraries*, **68** (11), 396-406.

Full Text: Spe Lib68, 396.pdf

? White, E.C. (1985), Bibliometrics - from Curiosity to Convention. *Special Libraries*, **76** (1), 35-42.

Keywords: Bibliometrics

? Noguchi, S. (1988), Japanese-style management: A bibliometric study. *Special Libraries*, **79** (4), 314-321.

# Title: Spectroscopy Letters

Full Journal Title: Spectroscopy Letters

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Armenta, S., Garrigues, S. and de la Guardia, M. (2005), Quantitative vibrational spectrometry in the 21st century: A scientometric evaluation. *Spectroscopy Letters*, **38** (6), 665-675.

Full Text: [2005\Spe Let38, 665.pdf](2005/Spe%20Let38,%20665.pdf)

Abstract: The state of the art of research on vibrational spectrometry-based quantitative methodologies was evaluated from the literature compiled in Analytical Abstracts from 1980. Medium and near infrared, Raman spectrometry, and photoacoustic methods of analysis were considered. The evolution of the number of published papers, the distribution of the literature as a function of the different application fields in which the vibrational methods were employed, and a study of the impact on this area of chemometric and automation studies clearly shows that, from the 1990s until now, the importance of vibrational spectrometry in application analysis has grown to reach maturity. This field provides alternative methods for industrial, environmental, and food analysis and in clinical studies. The most active research groups on these subjects have been identified from their scientific production in the first years of this century and from the journals in which this research is commonly published.

Keywords: Chemistry, Evaluation, FTIR, Infrared Spectrometry, NIR, Photoacoustic, Prediction, Quantitative Analysis, Raman, Research, Scientific Production, Scientometric, Spectroscopy, Vibrational Spectrometry

? Ródenas-Torralba, E., Morales-Rubio, Á. and de la Guardia, M. (2006), Scientometric picture of the evolution of the literature of automation in spectroscopy and its current state. *Spectroscopy Letters*, **39** (6), 513-532.

Full Text: [2006\Spe Let39, 513.pdf](2006/Spe%20Let39,%20513.pdf)

Abstract: The current study focuses on the status of automation and mechanization in spectroscopy for analytical chemistry publications compiled during the period 1980 2006, in Analytical Abstracts. Flow injection analysis (FIA), sequential injection analysis (SIA), multicommutation, and monosegmented and segmented flow strategies were considered. For assessing the evolution of scientific productivity, the total number of publications concerned with the different methodologies was evaluated. In order to provide a picture of the state of the art of this field, the most important journals, the most active authors, and the most productive countries in the field of automation were evaluated in the period of the first years of this century.

Keywords: Analysis, Analytical Chemistry, Authors, Automation, Chemistry, Continuous-Flow Analysis, Countries, Evolution, FIA, Field, Injection, Iron, Journals, Literature, Mechanization, Methodologies, Multicommutation, Multicommutation, Number of Publications, Productivity, Publications, Science, Scientific Productivity, Scientometric, SIA, Spectrophotometric Determination, Spectroscopy, System

? Armenta, S., Garrigues, S., de la Guardia, M. and Tahiri, S. (2007), Research on spectroscopy in Morocco from 1984 to 2006. *Spectroscopy Letters*, **40** (5), 681-693.

Full Text: [2007\Spe Let40, 681.pdf](2007/Spe%20Let40,%20681.pdf)

Abstract: The evolution of spectroscopy-based research activity in Morocco was evaluated on the basis of publications that have appeared in the Science Citation Index, Expanded (SCI), during the cumulative period 1984-2006 (September). The most active research groups, and their universities or centers, were identified in this subject from their scientific production in the first years of this century. The preference to publish in specific journals, the main areas of interest to Moroccan authors, and the spectroscopy techniques most commonly employed for their studies were also appraised. This scientometric study was undertaken to introduce a group of papers in a special issue of Spectroscopy Letters on Moroccan research in spectroscopy.

Keywords: Analytical-Chemistry, Authors, Citation, Citation Index, Evolution, Journals, Morocco, Papers, Publications, Research, Research Activity, SCI, Science, Science Citation Index, Scientific Production, Scientometrics, Spectroscopy, Universities

? Armenta, S. and de la Guardia, M. (2009), Green spectroscopy: A scientometric picture. *Spectroscopy Letters*, **42** (6-7), 277-283.

Full Text: [2009\Spe Let42, 277.pdf](2009/Spe%20Let42,%20277.pdf)

Abstract: The state of the art of green spectroscopy, as a sustainable and friendly alternative to the classical spectrometric methods of analysis, has been established from the evaluation of the scientific literature published about this topic in the frame of the so-called Green Chemistry paradigm. Special attention has been paid to the fact that keywords like Green Analytical Chemistry, environmentally friendly, or clean analytical method or sustainable analytical chemistry are far from being commonly used in analytical studies. In spite of this fact there are numerous studies that provide direct analytical methodologies, or a reduction of reagents consumption or waste generation, the recycling of used solvents, or the replacement of toxic compounds by non-toxic or, at least, less toxic ones. So, additional efforts must be made to engage the scientific community in the practice of making the work safer and more sustainable in the analytical laboratories.

Keywords: Analytical-Chemistry, Clean Analytical Chemistry, Environmentally Friendly Methods, Evaluation, Green Analytical Chemistry, Spectroscopy

# Title: Spectroscopy and Spectral Analysis

Full Journal Title: [Spectroscopy and Spectral Analysis](http://cnki50.csis.com.tw/kns50/Navi/item.aspx?NaviID=1&BaseID=GUAN&NaviLink=%e5%85%89%e8%b0%b1%e5%ad%a6%e4%b8%8e%e5%85%89%e8%b0%b1%e5%88%86%e6%9e%90)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1386-1425

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Subject Categories:

: Impact Factor

? Huang, Z.H., Sun, X.Y., Li, Y., Ge, W. and Wang, J.D. (2005), Adsorption behaviors of chitosan and the analysis of FTIR spectra. *Spectroscopy and Spectral Analysis*, **25** (5), 698-700.

Full Text: [2005\Spe Spe Ana25, 698.pdf](2005/Spe%20Spe%20Ana25,%20698.pdf)

Abstract: This paper studied the adsorption behavior of lab-made chitosan for acid dyeing waste water and basic dyeing waste waters, based on the effects of adsorbing time, deacetylation degree of chitosan, and pH of waste water. The results showed that the adsorption of basic fuchsin and saffron by the chitosan almost reached equilibrium state in 20 min. The adsorption capacities of the chitosan for dyes was comparable with activated carbon. Moreover, its dosages were only 2/3 of the latter. The adsorption process for Acid Red presented a dynamics character of first order reaction. FTIR spectroscopy was used to analyze the adsorption mechanisms of chitosan for different kinds of dyes. It was found that a great deal of hydroxide radicals in the chitosan molecule participated in the adsorption of basic fuchsin and saffron.

Keywords: Chitosan; FTIR; Dyes; Waste Water Treatment; Adsorption

? Zhang, D., Zhang, W.J., Guan, X., Gao, H. and He, H.B. (2009), Adsorption behavior of immobilized nanometer barium-strontium titanate for cadmium ion in water. *Spectroscopy and Spectral Analysis*, **29** (3), 824-828.

Full Text: [2009\Spe Spe Ana29, 824.pdf](2009/Spe%20Spe%20Ana29,%20824.pdf)

Abstract: Nanometer barium-strontium titanate immobilized on silica gel G was successfully prepared by the citrate acid sol-gel method and characterized using X-ray diffraction (XRD), scanning electron microscope (SEM) and Fourier transform infrared spectrophotometer (FTIR). By means of the determination of flame atomic absorption spectrometry (FAAS), the adsorption behavior of immobilized nanometer-barium strontium titanate for cadmium ion was investigated. The results showed that the nanometer barium-strontium titanate was immobilized on the silica gel G firmly, gaining a new sort of adsorbent. And the cadmium ion studied could be quantitatively retained in the pH value range of 4-7. The adsorption behavior followed a Freundlich adsorption isotherm and a pseudo-second-order kinetic model. The thermodynamic constants of the adsorption process, such as enthalpy changes (ΔH), Gibbs free energy changes (ΔG) and entropy changes (ΔS), were evaluated. These showed that the adsorption of cadmium ion by immobilized nanometer barium-strontium titanate was endothermic and spontaneous physical process. The cadmium ion adsorbed could be completely eluted using 1 mol . L-1 HNO3. A new method for the determination of trace cadmium ion in water based on this immobilized nanometer barium-strontium titanate preconcentration and FAAS determination was proposed. The method has been applied to the determination of trace cadmium ion in tap water and river water with satisfactory results.

Keywords: Acid, Adsorption, Adsorption Behavior, Cadmium Ion, Dithizone, Environmental-Samples, FAAS, Immobilized Nanometer Barium-Strontium Titanate, Lead-Ion, Packed Micro-Column, Powder, Silica Gel G, Simultaneous Online Preconcentration, Spectrometry, Titanium-Dioxide, Trace-Metals

? Fan, C.H., Zhang, Y., Zhang, Y.C., Li, J. and Chefetz, B. (2010), Cr(VI) adsorption mechanism on rice husk ash burned at low temperature by method of IR spectra. *Spectroscopy and Spectral Analysis*, **30** (9), 2345-2349.

Full Text: [2010\Spe Spe Ana30, 2345.pdf](2010/Spe%20Spe%20Ana30,%202345.pdf)

Abstract: Boehm titration method was used to analyze functional groups on cell surface of rice husk ash burned at low temperature in the present paper. Effects of initial pH value and temperature on Cr(VI) adsorption were studied, adsorption capacity was tested with the help of kinetic models and adsorption isotherms, instruments of Fourier transform infrared spectroscopy (FT-IR) and scanning electron microscope (SEM) were used to check characteristics and adsorption mechanism of Cr(VI). The results indicated that optimal removing rate was achieved at initial pH value 5, and pH values of aqueous solution changed little before and after adsorption process. The adsorbent of rice husk ash could remove Cr(VI) effectively, and the maximum removing rate could be 95% with Cr(VI) concentration 20 mg . L-1 and achieve 1-2 level of state standard (GB8978-1996). The adsorption process fits pseudo-second-order kinetic model and Langmuir isotherm better, the maximum adsorption capacity of Cr(VI) was 3. 277 6 mg. g-1 Results of FTIR showed that amide II band, Si-O-Si, O-Si-O were important for Cr(VI) removal. SEM micrographs revealed that series of needle-shaped precipitation appeared on cell surface, and inorganic precipitation mechanism and redox mechanism might work in the test. As a kind of low cost adsorbent, rice husk ash can be applied to remove heavy metals in environment with great potential.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Mechanism, Aqueous Solution, Biosorption, Capacity, Carbon, Characteristics, Chromium, Concentration, Cost, Cr(VI), Cr(VI) Adsorption, Environment, FTIR, Functional Groups, Heavy Metals, IR, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, L1, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Adsorbent, Low Temperature, Mechanism, Metal, Metals, Model, Models, pH, pH Value, Potential, Precipitation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rice, Rice Husk, Rice Husk Ash, Rice-Husk, SEM, Solution, State, Surface, Temperature, Value, Water, Work

# Title: Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy

Full Journal Title: [Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy](http://www.sciencedirect.com/science/journal/13861425)

ISO Abbrev. Title: Spectroc. Acta Pt. A-Molec. Biomolec. Spectr.

JCR Abbrev. Title: Spectrochim Acta A

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Language: Multi-Language

Journal Country/Territory: England

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Spectroscopy: Impact Factor 1.566, 19/39 (2009)

? Zhao, H.C., Ding, F., Wang, X.L., Ju, H.F., Li, A.Y. and Jin, L.P. (2008), A study on silver nanoparticles-sensitized fluorescence and second-order scattering of the complexes of Tb(III) with ciprofloxacin and its applications. *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, **70** (2), 332-336.

Full Text: [2008\Spe Act Par A-Mol Bio Spe70, 332.pdf](2008/Spe%20Act%20Par%20A-Mol%20Bio%20Spe70,%20332.pdf)

Abstract: Fluorescence of terbium(III) is sensitized when excited in the presence of ciprofloxacin (CPLX) in the aqueous solution because a Tb(III)-CPLX complex is formed and the maximum fluorescence peak locates at 545 nm. The second-order scattering (SOS) peak at 545 nm also appears for the Tb(III)-CPLX complexes with the excitation wavelength of 272 nm. The intensity at 545 nm obviously increases when the silver nanoparticles are added to the Tb(III)-CPLX system, and the relative intensity is proportional to the concentration of CPLX. Based on this phenomenon, a new method for the determination of CPLX has been developed by using a common spectrofluorometer to measure the intensity of fluorescence and SOS. The intensity is enhanced most by silver nanoparticles at pH 6.0. The calibration graph for CPLX is linear in the range of 3.0×10(-9) to 1.0×10-5 mol l-1. The detection limit is 8.5×10-10 mol l-1. The method was applied satisfactorily to the determination of CPLX in tablets and capsules. The results show that silver nanoparticles with certain size and concentration can enhance the fluorescence and SOS intensity of the system. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Capsules, Chemiluminescence, Ciprofloxacin, Fluorescence, Fluoroquinolones, Liquid-Chromatographic Determination, Nanoparticles, pH, Phase, Plasma, Rights, Samples, Scattering, Second Order, Second-Order, Second-Order Scattering, Serum, Silver, Silver Nanoparticles, Size, Solution, Surface-Enhanced Raman, Terbium

? Ghaedi, M., Amirabad, S.Z., Marahel, F., Kokhdan, S.N., Sahraei, R., Nosrati, M. and Daneshfar, A. (2011), Synthesis and characterization of cadmium selenide nanoparticles loaded on activated carbon and its efficient application for removal of Muroxide from aqueous solution. *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, **83** (1), 46-51.

Full Text: [2011\Spe Act Par A-Mol Bio Spe83, 46.pdf](2011/Spe%20Act%20Par%20A-Mol%20Bio%20Spe83,%2046.pdf)

Abstract: In the first, Cadmium selenide Nanoparticle loaded on activated carbon (CdSe-NP-AC) has been synthesized and characterized by different techniques including XRD and SEM. Then, this new adsorbent successfully has been applied for the removal of muroxide (MO) from aqueous solution in batch studies, while the effect of various experimental parameters like initial pH (pH(0)), contact time, amount of (CdSe-NP-AC) and initial MO concentration (C(0)) on its removal percentage was examined by one at a time optimization method. It was found following optimization of variable, the adsorption of MO onto (CdSe-NP-AC) followed pseudo-second-order kinetics and show Tempkin and Langmuir models for interpretation of experimental data. It was observed that by increasing the temperature the removal percentage was improved and the positive change in entropy (ΔS degrees) and heat of adsorption (ΔH degrees) show the endothermic nature of process, while the high negative value in Gibbs free energy change (ΔG degrees) indicates the feasible nature of adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Brilliant Green-Dye, Cadmium, Cadmium Selenide Nanoparticles, CdSe Nanostructures, Environmental-Samples, Heavy-Metal Ions, Industry Waste, Isotherm, Kinetic, Kinetics, Langmuir, Malachite Green, Methyl-Orange, Muroxide, pH, Rhodamine-B, Solid-Phase Extraction, Waste Materials

# Title: Spectrochimica Acta Part B-Atomic Spectroscopy

Full Journal Title: [Spectrochimica Acta Part B-Atomic Spectroscopy](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5287&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=9a473f176ccbd2753fbe9f7ef183c230)

ISO Abbreviated Title: Spectroc. Acta Pt. B-Atom. Spectr.

JCR Abbreviated Title: Spectrochim Acta B

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Journal Country England

Language: Multi-Language

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Spectroscopy: Impact Factor

Gomes, A.M., Sarrette, J.P., Madon, L. and Almi, A. (1996), Continuous emission monitoring of metal aerosol concentrations in atmospheric air. *Spectrochimica Acta Part B-Atomic Spectroscopy*, **51** (13), 1695-1705.

Full Text: [S\Spe Act Par B-Ato Spe51, 1695.pdf](S/Spe%20Act%20Par%20B-Ato%20Spe51,%201695.pdf)

Abstract: Improvements of an apparatus for continuous emission monitoring (GEM) by inductively coupled plasma atomic emission spectrometry (ICP-AES) of metal aerosols in air are described. The method simultaneously offers low operating costs, large volume of tested air for valuable sampling and avoids supplementary contamination or keeping of the air pollutant concentrations. Questions related to detection and calibration are discussed. The detection limits (DL) obtained for the eightpollutants studied are lower than the recommended threshold limit values (TLV) and as satisfactory as the results obtained with other CEM methods involving air-argon plasmas.

Bağ, H., Türker, A.R., Coşkun, R., Saçak, M. and Yiğitoğlu, M. (2000), Determination of zinc, cadium, cobalt and nickel by flame atomic absorption spectrometry after preconcentration by poly(ethylene terephthalate) fibers grafted with methacrylic acid. *Spectrochimica Acta Part B-Atomic Spectroscopy*, **55** (7), 1101-1108.

Full Text: [S\Spe Act Par B-Ato Spe55, 1101.pdf](S/Spe%20Act%20Par%20B-Ato%20Spe55,%201101.pdf)

Abstract: A method for the determination of Zn, Cd, Co and Ni by flame atomic absorption spectrophotometry after preconcentrating on poly(ethylene terephthalate) fibers grafted with methacrylic acid has been developed. The batch adsorption method was used for the preconcentration studies. Effect of pH, amount of adsorbent, concentration and volume of elution solution, shaking time and interfering ions on the recovery of the analytes have been investigated. Recoveries of Zn, Cd, Co and Ni were 97.3±0.4%, 98.3±0.2%, 94.1±0.3% and 96.5±0.6% at 95% confidence level, respectively, at optimum conditions. Langmuir adsorption isotherm curves were also studied for the analytes. The adsorption capacity of the adsorbent was found as 298, 412, 325 and 456 mg/g for Zn, Cd, Co and Ni, respectively. Poly(ethylene terephthalate) fibers grafted with methacrylic acid are suitable for repeated use without loss of capacity for more than thirty cycles. The proposed method was applied to the determination of trace metals in river water and synthetic sea water. Trace metals have been determined with high precision. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Trace Element, Preconcentration, Polymer, Water, Flame Atomic Absorption Spectrometry, Amberlite Xad-16 Resin, Emission

Godlewska-Żyłkiewicz, B. (2003), Biosorption of platinum and palladium for their separation/preconcentration prior to graphite furnace atomic absorption spectrometric determination. *Spectrochimica Acta Part B-Atomic Spectroscopy*, **58** (8), 1531-1540.

Full Text: [S\Spe Act Par B-Ato Spe58, 1531.pdf](S/Spe%20Act%20Par%20B-Ato%20Spe58,%201531.pdf)

Abstract: Inexpensive baker’s yeast *Saccharomyces cerevisiae* and green algae *Chlorella vulgaris*, either free or immobilized on silica gel have been shown to selectively accumulate platinum and palladium from water samples in acidic medium (pH 1.6–1.8). Optimization of conditions of metals biosorption (sample pH, algae and yeast masses, adsorption time, temperature) was performed in batch mode. The procedure of matrix separation based on biosorption of platinum and palladium on algae *C. vulgaris* covalently immobilized on silica gel in flow mode was developed. The use of algae in flow procedure offers several advantages compared with its use in the batch mode. The procedure shows better reproducibility (<2%), improved efficiency of platinum retention on the column (93.3±1.6%), is less laborious and less time consuming. The best recovery of biosorbed metals from column (87.7±3.3% for platinum and 96.8±1.1 for palladium) was obtained with solution of 0.3 mol l-1 thiourea in 1 mol l-1 hydrochloric acid. The influence of thiourea on analytical signals of examined metals during GFAAS determination is discussed. The procedure has been applied for separation of noble metals from tap and waste water samples spiked with platinum and palladium.

Keywords: Platinum, Palladium, Separation, Biosorption, Graphite Furnace Atomic Absorption Spectrometry, Yeast, Immobilized Algae

? Costa, L.M., Ribeiro, E.S., Segatelli, M.G., do Nascimento, D.R., de Oliveira, F.M. and Tarley, C.R.T. (2011), Adsorption studies of Cd(II) onto Al2O3, Nb2O5 mixed oxide dispersed on silica matrix and its on-line preconcentration and determination by flame atomic absorption spectrometry. *Spectrochimica Acta Part B-Atomic Spectroscopy*, **66** (5), 329-337.

Full Text: [2011\Spe Act Par B-Ato Spe66, 329.pdf](2011/Spe%20Act%20Par%20B-Ato%20Spe66,%20329.pdf)

Abstract: The present study describes the adsorption characteristic of Cd(II) onto Nb(2)O(5), Al(2)O(3) mixed oxide dispersed on silica matrix. The characterization of the adsorbent has been carried out by infrared spectroscopy (IR), scanning electronic microscopy (SEM), energy dispersive spectroscopy (EDS), energy dispersive X-ray fluorescence analysis (EDXRF) and specific surface area (S(BET)). From batch experiments, adsorption kinetic of Cd(II) was described by a pseudo-second-order kinetic model. The Langmuir linear isotherm fitted to the experimental adsorption isotherm very well, and the maximum adsorption capacity was found to be 17.88 mg g-1. Using the effective material, a method for Cd(II) preconcentration at trace level was developed. The method was based on on-line adsorption of Cd(II) onto SiO2, Al2O3, Nb2O5 at pH 8.64, in which the quantitative desorption occurs with 1.0 mol L-1 hydrochloric acid towards FAAS detector. The experimental parameters related to the system were studied by means of multivariate analysis, using 2(4) full factorial design and Doehlert matrix. The effect of SO42-, Cu2+, Zn2+ and Ni2+ foreign ions showed no interference at 1:100 analyte:interferent proportion. Under the most favorable experimental conditions, the preconcentration system provided a preconcentration factor of 18.4 times, consumption index of 1.08 ml, sample throughput of 14 h-1, concentration efficiency of 4.35 min-1, linear range from 5.0 up to 35.0 mu g L-1 and limits of detection and quantification of 0.19 and 0.65 mu g L-1 respectively. The feasibility of the proposed method for Cd(II) determination was assessed by analysis of water samples, cigarette sample and certified reference materials TORT-2 (Lobster hepatopancreas) and DOLT-4 (Dogfish liver). (C) 2011 Elsevier ay. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Carbon Nanotubes, Cd(II), Ceria Nanoparticles, Characterization, Desorption, Doehlert Matrix, Environmental-Samples, FAAS, Factorial Design, Isotherm, Kinetic, Kinetic Model, Langmuir, Multivariate Analysis, Pb(II) Ions, pH, Preconcentration, Selective Separation, SEM, Silica, Silica, Alumina, Niobia, Solid-Phase Extraction, System, Trace-Metals, Water

# Title: Spill Science & Technology Bulletin

Full Journal Title: [Spill Science & Technology Bulletin](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6056&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=bac37efb7847687ccac5bc207bcd4e2b)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Roulia, M., Chassapis, K., Fotinopoulos, C., Savvidis, T. and Katakis, D. (2003), Dispersion and sorption of oil spills by emulsifier-modified expanded perlite. *Spill Science & Technology Bulletin*, **8** (5-6), 425-431.

Full Text: [2003\Spi Sci Tec Bul8, 425.pdf](2003/Spi%20Sci%20Tec%20Bul8,%20425.pdf)

Abstract: Three grain sizes of expanded perlite were modified with emulsifiers and their potential usefulness in combating oil spills was studied. The tests in the laboratory show that when this perlite is added to a water-oil mixture, the light perlite particles move on the surface spreading over it very quickly (in fractions of a second). It seems that the emulsifier disperses the oil, but at the same time it disperses the perlite particles. At the end there is an emulsion and also perlite particles saturated with it. The usefulness in combating oil spills at sea depends on the following characteristics: (a) With emulsifier-modified perlite some of the oil can be removed (in the form of emulsion), whereas with emulsifiers only this is not possible. Simultaneously the spill is dispersed quickly, before spreading. (b) The action is quick even with a calm sea. Self-mixing is inherent to the process. (c) The action is quick and limited to the surface, where the perlite particles float. There is little waste of the emulsifier in the bulk of the sea. (C) 2002 Elsevier Ltd. All rights reserved.

Keywords: Emulsifiers, Expanded Perlite, Fractions, Light, Modified, Natural Glass, Oil, Oil Spill Dispersion, Oil Spills, Particles, Perlite, Silicate-Glasses, Sorption, Spreading, Surface, Waste, Water

Saito, M., Ishii, N., Ogura, S., Maemura, S. and Suzuki, H. (2003), Development and water tank tests of sugi bark sorbent (SBS). *Spill Science & Technology Bulletin*, **8** (5-6), 475-482.

Full Text: [S\Spi Sci Tec Bul8, 475.pdf](S/Spi%20Sci%20Tec%20Bul8,%20475.pdf)

Abstract: Development of the oil sorbent (oil adsorption material) made of organic waste material were initiated in order to provide the resources for marine oil spill response with less environmental load and cost. After some screening, it was found that the fiber of Sugi (*Cryptomeria japonica D. Don*) bark has potential to be excellent oil sorbent because of its hydrophobic and oleophilic character. As this bark fiber Sugi bark sorbent (SBS) can be used with enclosing cotton sheet, the products consist of completely organic materials. When the bark fibers were dried of larger size, SBS had increased absorbency. SBS performed equivalent absorbency (picking up at most 13.4 times their own weight in bunker A) as conventional polypropylene sorbent in laboratory experiments. Experiments conducted in water tanks confirmed that some shape of SBSs such as S25, S50, B6S14 and M50 could successfully work for recovering oil in small wave and current, which would be expected as production models. After all, S50 and M50 were improved into commercial products, which started to be released in 2001 at Japan.

Keywords: Sugi Bark Sorbent (SBS), Sorbent Uptake Rates, Laboratory Studies, Modified SBS, Simulated Studies in Water Tanks with Oil Absorption, Comparison to Polypropylene Sorbents

# Title: Spinal Cord

Full Journal Title: [Spinal Cord](http://www.nature.com/sc/index.html)

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Language: English

Publisher: Stockton Press

Publisher Address: Houndmills, Basingstoke RG21 6XS, Hampshire, England

Subject Categories:

Clinical Neurology Orthopedics: Impact Factor 0.953, 86/138 (2002)

Lin, K.H., Chuang, C.C., Kao, M.J., Lien, I.N. and Tsauo, J.Y. (1997), Quality of life of spinal cord injured patients in Taiwan: A subgroup study. *Spinal Cord*, **35** (12), 841-849.

Full Text: [S\Spi Cor35, 841.pdf](S/Spi%20Cor35,%20841.pdf)

Abstract: The major purposes of this study were to assess the quality of life (QOL) of spinal cord injured patients, and to assess the possible factors affecting the QOL. The survey was conducted from 1992-1993 by mailed questionnaires to members of Spinal Cord Injury Association of the Republic of China. There were 347 quality responses with the mean age of 37.5±10.2 years old and the mean duration of illness of 7.8±6.8 years. The questionnaire included five domains, physical mobility, environment-transportation: psychosocial adjustment, education, and economics for a total of 39 items. Each item contained a rating of ‘importance’ and ‘satisfaction’. The quality of life index (QLI) was calculated by multiplying the satisfaction score with the importance score, then dividing by the possible highest score. The major results included: (1) the subjects had mild to moderate dissatisfaction with most items in five domains except psychosocial adjustment, (2) quality of life in those with complete tetraplegia (QLI =-0.41) and incomplete tetraplegia (QLI =-0.31) was significantly lower than that of those with complete paraplegia (QLI =-0.13) and incomplete paraplegia (QLI =-0.04), (3) both the severity of injury, and the post-injury working status were the major factors affecting the life quality of spinal cord injured patients in Taiwan.

Keywords: Of-Life, Psychosocial Adjustment, Illness Scale, Rehabilitation, Community, Quality of Life, Spinal Cord Injury, Taiwan

Dijkers, M.P.J.M. (2003), Searching the literature for information on traumatic spinal cord injury: The usefulness of abstracts. *Spinal Cord*, **41** (2), 76-84.

Full Text: [S\Spi Cor41, 76.pdf](S/Spi%20Cor41,%2076.pdf)

Abstract: Study design: Systematic review of abstracts of published papers presumed to contain information on chronic pain in persons with spinal cord injury (SCI).

Objectives: To determine to what degree papers on SCI are abstracted in such a way that they can be retrieved, and evaluated as to the paper’s applicability to a reader’s questions.

Setting: US-academic department of rehabilitation medicine.

Methods: 868 abstracts published in Medline were independently examined by two out of 13 screeners, who answered four questions on the subjects and nature of the paper with ‘Yes’, ‘No’ or ‘insufficient information’. Frequency of ratings ‘insufficient information’, and screener agreement were evaluated as affected by screener and abstract/paper characteristics.

Results: Screeners could not determine whether the paper dealt with persons with traumatic SCI for 37% of abstracts, whether chronic pain was a topic could not be determined in 18%. Physicians were less willing than other disciplines to assign ‘insufficient information’. Screener agreement was better than chance, but not at the level suggested for quality measurement. Screener discipline and task experience did not make a difference, nor did abstract length, structure, or decade of publication of the paper.

Conclusion: Authors need to improve the quality of abstracts to make retrieval and screening of relevant papers more effective and efficient.

Sponsorship: National Institute on Disability and Rehabilitation Research.

Keywords: Abstracting and Indexing, Publications, Bibliometrics, Spinal Cord Injury, Pain, Original Research Articles, Structured Abstracts, Clinical-Trials, High Agreement, Low Kappa, Quality, Journals, Accuracy, Paradoxes, Medline

? Berney, S., Bragge, P., Granger, C., Opdam, H. and Denehy, L. (2011), The acute respiratory management of cervical spinal cord injury in the first 6 weeks after injury: A systematic review. *Spinal Cord*, **49** (1), 17-29.

Full Text: 2011\Spi Cor49, 17.pdf

Abstract: Study design: Systematic review. Objectives: Identify, evaluate, and synthesize evidence regarding the effectiveness of various treatment strategies for the respiratory management of acute tetraplegia. Setting: Melbourne, Australia. Methods: A search of multiple electronic databases (MEDLINE, Cinahl, EMBASE, Cochrane Library, Web of Science, http://www.guideline.gov and http://www.icord.org/scire) was undertaken accompanied by the reference lists of all relevant articles identified. Methodological quality was assessed using the Newcastle-Ottawa Scale and the PEDro Scale. Descriptive analysis was performed. Results: Twenty-one studies including 1263 patients were identified. The majority of the studies were case series (n = 13). A variety of interventions were used for the management of respiratory complications. Mortality (ARR = 0.4, 95% confidence interval (CI) 0.18, 0.61), the incidence of respiratory complications (ARR = 0.36, 95% CI (0.08, 0.58)), and requirement for a tracheostomy (ARR = 0.18, 95% CI (-0.05, 0.4)) were significantly reduced by using a respiratory protocol. A clinical pathway reduced duration of mechanical ventilation by 6 days 95% CI (-0.56, 12.56), intensive care unit length of stay by 6.8 days 95% CI (0.17-13.77) and costs. Intubation, mechanical ventilation, and tracheostomy are the mainstay of respiratory management for complete injuries above the level of C5. Conclusion: This review showed a clinical pathway with a structured respiratory protocol that includes a combination of treatment techniques provided regularly is effective in reducing respiratory complications and cost. The overall study quality was moderate and further studies using specific interventions that target respiratory complications are associated with specific regions of the cervical spine using more methodologically rigorous designs are required. Spinal Cord (2011) 49, 17-29; doi: 10.1038/sc.2010.39; published online 20 April 2010.

Keywords: Acute, Analysis, Care, Case Series, Cochrane, Complications, Costs, Databases, Design, Effectiveness, Embase, Incidence, Injury, Intensive Care, Intensive Care Unit, Interventions, Length of Stay, Management, Mechanical Ventilation, Methods, Mortality, Patients, Protocol, Pulmonary Complications, Respiratory, Respiratory Management, Review, Scale, Science, Spinal Cord Injury, Spine, Systematic, Systematic Review, Tetraplegia, Tracheostomy, Traumatic Quadriplegia, Treatment, Trials, Web of Science

# Title: Spine

Full Journal Title: Spine

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JCR Abbreviated Title: Spine

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Walsh, E.F. and Weinstein, J.N. (1998), Spine: Scientific citation index and its impact factor. *Spine*, **23** (10), 1087-1090.

Full Text: 1998\Spine23, 1087.pdf

Keywords: Citation, Impact, Impact Factor, Index

? Roach, J.W., Skaggs, D.L., Sponseller, P.D. and MacLeod, L.M. (2008), Is research presented at the Scoliosis Research Society annual meeting influenced by industry funding? *Spine*, **33** (20), 2208-2212.

Full Text: [2008\Spine33, 2208.pdf](2008/Spine33,%202208.pdf)

Abstract: Study Design. All abstracts submitted to the 2006 SRS annual meeting were reviewed. Objective. To determine the rate of funding in abstracts submitted for presentation at the 2006 Annual Scoliosis Research Society (SRS) meeting and whether funding produced bias toward a positive outcome. Summary of Background Data. Financial conflicts of interest have been attributed to bias in research. Methods. Three members the SRS Program Committee reviewed 610 abstracts submitted for presentation at the 2006 annual meeting. The committee’s average grade was correlated with type of funding (industry, professional society, university); abstract conclusions (favorable, unfavorable, or only descriptive); and subject category [adolescent idiopathic scoliosis (AIS), motion preservation, etc.]. Results. Of the 610 submitted articles, 72% (n = 440) were unfunded. Of the 170 funded articles, 140 were supported by industry, 7 by government agency, 8 by professional societies, 4 by universities, and 11 by private foundations. There was no statistically significant difference between the reviewers’ grades of funded versus unfunded articles (P = 0.39). Comparing AIS articles to all the other categories, the number of funded articles were significantly greater only in motion preservation (P < 0.001) and genetics (P = 0.039). When a consultant/employee relationship was present, there was a significant difference in the proportion of funded articles and favorable findings (P = 0.048). Conclusion. The higher percentage of funded articles in motion preservation and genetics compared to AIS articles could reflect a bias in those 2 areas. However, although there were more funded articles in those 2 areas there were not more funded, favorable articles (motion preservation P = 0.059, and genetics P = 0.3). Thus, certain categories attracted more funding than others but there was not a bias toward favorable findings within the funded articles unless the funding was due to a consultant/employee relationship.

Keywords: Association, Author, Bias, Clinical Investigators, Conflict of Interest, Conflict-of-Interest, Funding, Industry, Interest, Issues, Methods, Orthopedic Research, Professional, Research, Research Support, Spine, Subject Category, University

? Street, J., Berven, S., Fisher, C. and Ryken, T. (2009), Health related quality of life assessment in metastatic disease of the spine a systematic review. *Spine*, **34**, S128-S134.

Full Text: [2009\Spine34, S128.pdf](2009/Spine34,%20S128.pdf)

Abstract: Study Design. Systematic literature review. Objectives. To examine the available literature on health related quality of life (HRQOL) assessment in metastatic disease of the spine and identify the optimal functional outcome scales to be used in developing a disease-specific tool. Summary of Background Data. There is a lack of consensus in the use of HRQOL measures in patients with metastatic spine disease. Methods. A systematic review was conducted using MEDLINE, EMBASE, the Science Citation Index (ISI), the Cumulative Index to Nursing and Allied Health Literature, the PsycINFO, the Allied and Complementary Medicine (AMED), Cochrane Reviews and Global Health databases for clinical studies addressing metastatic spine disease from 1966 through 2008. The validity of outcome tools was established by linkage analysis with the International Classification of Functioning Disability and Health (ICF). Results. One hundred forty-one clinical studies met inclusion criteria including 10,347 patients. Only 5 moderate grade and 1 high grade study were identified. Thirty-four studies used a patient self-assessment instrument to assess health status. None of the instruments were validated for metastatic spine patients. The most commonly used Pi-by-no tools were SF-36, SIP 5, and the ADL. None of the studies defined health related quality of life (HRQOL) or justified the choice of instrument. The most commonly used cancer-specific tools were ECOG, EORTC QCQ-C30, and EUROQOL 5D. Based on frequency of citation and on correlation with the International Classification of Functioning Disability and Health, the ECOG and SF36 were judged as most valid and reliable. Conclusion. A systematic review of the available evidence suggests that valid and reliable health related quality of life measures exist for the assessment of oncology patients, however, a disease-specific tool for metastatic spine disease awaits development. Until such time as a disease-specific tool is available, we recommend that the ECOG and SF-36 be considered for use in studies addressing the outcome assessment of patients with metastatic spine disease.

Keywords: Assessment, Balloon Kyphoplasty, Citation, Classification, Clinical-Experience, Cord Compression, Correlation, Criteria, Databases, Design, Development, Disability, EN-BLOC Spondylectomy, EORTC QLQ-C30, Health, Health Related Quality of Life, Health Status, Instruments, International, Isi, Literature, Literature Review, Lumbar Spine, Lung-Cancer, Medline, Metastatic Disease, Oncology, Review, Science, Science Citation Index, Self-Assessment, Surgical-Management, Systematic Literature Review, Systematic Review, Tools, Tumors, Validation, Validity

# Title: Sports Medicine

Full Journal Title: [Sports Medicine](http://adisonline.com/sportsmedicine/pages/issuelist.aspx)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gissane, C., Jennings, D., Kerr, K. and White, J.A. (2002), A pooled data analysis of injury incidence in rugby league football. *Sports Medicine*, **32** (3), 211-216.

Full Text: 2002\Spo Med32, 211.pdf

Abstract: Objective: The aim of this study was to summarise the injury rates in professional rugby league football. Methods: Previously published studies were identified from database searches of the literature from MEDLINE, Sports Discus and Web of Science. A total of 18 articles. which reported the prospective injury data collection for at least one playing season in professional rugby league worldwide, were included. The definition of injury adopted required an injured player to miss the subsequent game through injury. Ten studies satisfied the injury definition criteria for inclusion. A review of articles and extraction of relevant data were carried out independently by two authors. Results: A total of 517 injuries were reported during 12 819 hours of exposure (753 games), which resulted in an overall injury rate of 40.3 injuries per 1000 hours [95% confidence interval (CI) 36.9 to 43.8]. Most injuries were to the lower half of the body (20.7 per 1000 hours, 95% CI 17.7 to 24), with the trunk receiving the least (6.7 per 1000 hours, 95% CI 5 to 8.6). Conclusions: Injury rates in professional rugby league are higher than in some other contact sports, probably because of the large number of physical collisions that take place. This pooled data analysis provides more accurate estimates of injury incidence in the game of professional rugby league football.

Keywords: Analysis, Authors, Club, Data Collection, Exposure, Games, Incidence, Injury, Literature, Methods, Professional, Review, Science, Sports, Web of Science

? Martyn-St James, M. and Carroll, S. (2006), Progressive high-intensity resistance training and bone mineral density changes among premenopausal women - Evidence of discordant site-specific skeletal effects. *Sports Medicine*, **36** (8), 683-704.

Full Text: 2006\Spo Med36, 683.pdf

Abstract: Regular weight-bearing physical activity has been widely recommended for adult women and may be beneficial in preserving bone mineral density (BMD). However, there is conflicting evidence regarding the effects of resistance training on BMD in premenopausal women. Novel systematic review and meta-analysis evidence is presented on the effects of progressive high-intensity resistance training on BMD in premenopausal women. Structured computer searches of MEDLINE, EMBASE, PUBMED, Web of Science, SportDiscus and Evidence Based Medicine Reviews Multifile were undertaken along With hand-searching of key journals and reference lists to locate relevant studies published up to September 2004. Criteria for included studies were published controlled studies and randomised controlled trials (RCTs) evaluating the effects of progressive, high-intensity resistance training studies on BMD in premenopausal women. Two authors reached consensus on all included and excluded studies. Study outcomes for analysis were radiographic BMD assessment from first follow-up at lumbar spine and femoral neck. Primary outcomes for analysis were absolute changes in BMD g/cm(2) at lumbar spine and femoral neck. Relative changes (percentage change) in BMD at lumbar spine were also assessed. Data were extracted from studies including study design, participant characteristics and treatment mode, intensity and duration, using electronic data extraction forms. Where necessary, relevant information was obtained by contacting study authors. Methodological quality of studies was assessed using a well recognised three-question instrument designed to assess bias. Informal assessment for small sample study effects and potential bias was undertaken through visual inspection of funnel plots. The weighted mean difference method (inverse of the variances) was used for combining study group estimates. Quantification of the effect of heterogeneity among study outcomes was assessed using the 12 statistic. Random effects and fixed-effect models were applied according to observed study heterogeneity. Comparisons resulting in I-2 > 50.0% were considered heterogeneous. Where heterogeneity was observed, a random effects model was applied. Pooled estimates of effect were calculated using the Cochrane Collaboration’s Review Manager (RevMan) 4.2.1 software. High-intensity progressive resistance training was shown to be efficacious in increasing absolute BMD at the lumbar spine (p < 0.00001) but not the femoral neck (p = 0.78) in premenopausal women. The weighted mean difference (WMD) using a fixed-effect model for six controlled trials investigating the lumbar spine BMD change was 0.014 g/cm(2) (95% CI 0.009, 0.019; p < 0.00001). The relative BMD change for this site was 0.98% (WMD [random effects], 95% CI 0.49, 3.91%; p = 0.04). In contrast, studies evaluating femoral neck BMD changes showed no significant BMD change (WMD [fixed effect], 0.001 g/cm(2) 95% CI -0.006, 0.008; p = 0.78). Funnel plot inspection of lumbar spine effects indicated that smaller studies demonstrated larger treatment effects. An asymmetry towards studies with positive BMD outcomes was also noted. The methodological quality score of all included studies was low and no study presented a valid intention-to-treat accounting for participant drop-out (attrition). As such, the modest overall treatment effects for resistance training on BMD among premenopausal women observed in this review may be biased and should be interpreted with caution. It is concluded that further RCTs of resistance training of sufficiently long duration and providing optimum type, intensity and volume of loading, with intention-to-treat analysis are now required.

Keywords: Adult, Analysis, Assessment, Authors, Bias, Body Bone, Bone, Bone Mineral Density, Clinical-Trials, Cochrane, Computer, Consort Statement, Controlled Studies, Design, Discordant, Embase, Follow-up, Hip Fracture, Information, Journals, Medline, Meta-Analysis, Model, Outcomes, Physical Activity, Physical-Activity, Postmenopausal Women, Primary, Pubmed, Randomized Controlled-Trials, Resistance, Resistance Training, Review, Science, Software, Spine, Systematic, Systematic Review, Systematic Reviews, Training, Treatment, Web of Science, Women, X-Ray Absorptiometry, Young-Women

? Muaidi, Q.I., Nicholson, L.L., Refshauge, K.M., Herbert, R.D. and Maher, C.G. (2007), Prognosis of conservatively managed anterior Cruciate ligament injury - A systematic review. *Sports Medicine*, **37** (8), 703-716.

Full Text: [2007\Spo Med37, 703.pdf](2007/Spo%20Med37,%20703.pdf)

Abstract: Anterior cruciate ligament (ACL) rupture is a common sporting injury, often managed surgically with patella-tendon or hamstrings-gracilis autograft. Some people who sustain the injury, request information about their prognosis if they choose to forgo surgery and opt for conservative management. Numerous studies provide data on the prognosis of conservatively managed ACL injuries. These studies have not been systematically reviewed. Thus, the aims of this systematic review are to describe the natural history and clinical course of function and proprioception in the conservatively managed ACL-deficient knee, and to identify prognostic factors. We searched MEDLINE, CINAHL, EMBASE, SportDiscus, PEDro and the Cochrane Central Register of Clinical Trials without language restrictions from the earliest record available up to July 2006. We also searched the Science Citation Index, and iteratively searched bibliographies for prospective studies of outcomes (> 6 months follow-up) of conservatively managed complete ACL tears. Six criteria were used to assess the methodological quality of included studies. The main outcome measures were self-reported measures of knee function, activity level, performance in functional tasks and knee proprioception. Fifteen studies of variable methodological quality were included in the review. On average, patients with mixed or isolated ACL-deficient knees reported good knee function (87/100 Lysholm knee scale) at follow-up duration of 12-66 months. On average, functional performance assessed with the hop-for-distance test, was in the normal range. From pre-injury to follow-up there was a reduction in Tegner activity level of 21.3%. According to the methods used in the assessed studies, conservatively managed ACL-deficient knees have a good short- to mid-term prognosis in terms of self-reported knee function and functional performance. However, subjects reduced their activity levels on average by 21% following injury.

Keywords: Acute Rupture, Bibliographies, Citation, Clinical-Trials, Criteria, Cruciate Ligament, Deficient Knees, Functional Disability, History, Knee Scoring Questionnaires, Language, Management, Medline, Methods, Natural-History, Nonoperative Treatment, Outcomes, Prognosis, Quality Scores, Reduction, Review, Scale, Science, Science Citation Index, Surgery, Systematic Review, Term Follow-up, Treated Tears

? de Salles, B.F., Simao, R., Miranda, F., Novaes, J.D., Lemos, A. and Willardson, J.M. (2009), Rest interval between sets in strength training. *Sports Medicine*, **39** (9), 765-777.

Full Text: [2009\Spo Med39, 765.pdf](2009/Spo%20Med39,%20765.pdf)

Abstract: Strength training has become one of the most popular physical activities for increasing characteristics such as absolute muscular strength, endurance, hypertrophy and muscular power. For efficient, safe and effective training, it is of utmost importance to understand the interaction among training variables, which might include the intensity, number of sets, rest interval between sets, exercise modality and velocity of muscle action. Research has indicated that the rest interval between sets is an important variable that affects both acute responses and chronic adaptations to resistance exercise programmes. The purpose of this review is to analyse and discuss the rest interval between sets for targeting specific training outcomes (e.g. absolute muscular strength, endurance, hypertrophy and muscular power). The Scielo, Science Citation Index, National Library of Medicine, MEDLINE, Scopus, Sport Discus and CINAHL databases were used to locate previous original scientific investigations. The 35 studies reviewed examined both acute responses and chronic adaptations, with rest interval length as the experimental variable. In terms of acute responses, a key finding was that when training with loads between 50% and 90% of one repetition maximum, 3-5 minutes’ rest between sets allowed for greater repetitions over multiple sets. Furthermore, in terms of chronic adaptations, resting 3-5 minutes between sets produced greater increases in absolute strength, due to higher intensities and volumes of training. Similarly, higher levels of muscular power were demonstrated over multiple sets with 3 or 5 minutes versus 1 minute of rest between sets. Conversely, some experiments have demonstrated that when testing maximal strength, 1-minute rest intervals might be sufficient between repeated attempts, however, from a psychological and physiological standpoint, the inclusion of 3- to 5-minute rest intervals might be safer and more reliable. When the training goal is muscular hypertrophy, the combination of moderate-intensity sets with short rest intervals of 30-60 seconds might be most effective due to greater acute levels of growth hormone during such workouts. Finally, the research on rest interval length in relation to chronic muscular endurance adaptations is less clear. Training with short rest intervals (e.g. 20 seconds to 1 minute) resulted in higher repetition velocities during repeated submaximal muscle actions and also greater total torque during a high-intensity cycle test. Both of these findings indirectly demonstrated the benefits of utilizing short rest intervals for gains in muscular endurance. In summary, the rest interval between sets is an important variable that should receive more attention in resistance exercise prescription. When prescribed appropriately with other important prescriptive variables (i.e. volume and intensity), the amount of rest between sets can influence the efficiency, safety and ultimate effectiveness of a strength training programme.

Keywords: Bench Press Performance, Citation, Databases, Endurance, Exercise, Heavy-Resistance Exercise, High-Intensity, Hormonal Responses, Length, Medline, Muscle, Muscular Adaptations, Outcomes, Protocols, Recovery, Research, Review, Science, Science Citation Index, Scopus

? Collins, N.J., Bisset, L.M., Crossley, K.M. and Vicenzino, B. (2012), Efficacy of nonsurgical interventions for anterior knee pain systematic review and meta-analysis of randomized trials. *Sports Medicine*, **42** (1), 31-49.

Full Text: [2012\Spo Med42, 31.pdf](2012/Spo%20Med42,%2031.pdf)

Abstract: Anterior knee pain is a chronic condition that presents frequently to sports medicine clinics, and can have a long-term impact on participation in physical activity. Conceivably, effective early management may prevent chronicity and facilitate physical activity. Although a variety of nonsurgical interventions have been advocated, previous systematic reviews have consistently been unable to reach conclusions to support their use. Considering a decade has lapsed since publication of the most recent data in these reviews, it is timely to provide an updated synthesis of the literature to assist sports medicine practitioners in making informed, evidence-based decisions. A systematic review and meta-analysis was conducted to evaluate the evidence for nonsurgical interventions for anterior knee pain. A comprehensive search strategy was used to search MEDLINE, EMBASE, CINAHL (R) and Pre-CINAHL (R), PEDro, PubMed, SportDiscus (R), Web of Science (R), BIOSIS Previews (R), and the full Cochrane Library, while reference lists of included papers and previous systematic reviews were hand searched. Studies were eligible for inclusion if they were randomized clinical trials that used a measure of pain to evaluate at least one nonsurgical intervention over at least 2 weeks in participants with anterior knee pain. A modified version of the PEDro scale was used to rate methodological quality and risk of bias. Effect size calculation and meta-analyses were based on random effects models. Of 48 suitable studies, 27 studies with low-to-moderate risk of bias were included. There was minimal opportunity for meta-analysis because of heterogeneity of interventions, comparators and follow-up times. Meta-analysis of high-quality clinical trials supports the use of a 6-week multimodal physiotherapy programme (standardized mean difference [SMD] 1.08, 95% CI -0.73, 1.43), but does not support the addition of electromyography biofeedback to an exercise programme in the short-term (4 weeks: SMD -0.21, 95% CI -0.64, 0.21; 8-12 weeks: SMD -0.22, 95% CI 0.65, 0.20). Individual study data showed beneficial effects for foot orthoses with and without multimodal physiotherapy (vs flat inserts), exercise (vs control), closed chain exercises (vs open chain exercises), patella taping in conjunction with exercise (vs exercise alone) and acupuncture (vs control). Findings suggest that, in implementing evidence-based practice for the nonsurgical management of anterior knee pain, sports medicine practitioners should prescribe local, proximal and distal components of multimodal physiotherapy in the first instance for suitable patients, and then consider foot orthoses or acupuncture as required.

Keywords: Bias, Chondromalacia Patellae, Chronic Condition, Clinical Trials, Clinical-Trials, Cochrane, Control, Efficacy, Electric Muscle Stimulation, Embase, Evidence-Based Practice, Exercise, Exercises, Follow-Up, Foot Orthoses, Hand, Impact, Injuries, Intervention, Interventions, Kinetic Chain Exercises, Knee, Literature, Management, Medicine, Medline, Meta Analysis, Meta-Analysis, Modified, Orthoses, Pain, Papers, Participation, Patellofemoral Pain, Patients, Physical Activity, Physical Interventions, Practice, Publication, Pubmed, Quality, Randomized Clinical Trials, Review, Risk, Science, Sports, Strategy, Synthesis, Systematic, Systematic Review, Systematic Reviews, Therapy, Web of Science, Web-of-Science

# Title: SRA-Journal of the Society of Research Administrators

Full Journal Title: [SRA-Journal of the Society of Research Administrators](http://proquest.umi.com/pqdlink?Ver=1&Exp=11-02-2015&RQT=318&PMID=18912&clientId=39645&cfc=1)

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ISSN: 1062-8142

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Subject Categories:

: Impact Factor

? Porter, A.L., Jin, X.Y., Gilmour, J.E., Cunningham, S., Xu, H.D., Stanard, C. and Wang, L. (1994), Technology opportunities analysis: Integrating technology monitoring, forecasting, and assessment with strategic planning. *SRA-Journal of the Society of Research Administrators*, **26** (2), 21-31.

Full Text: [1994\SRA-J Soc Res Adm26, 21.pdf](1994/SRA-J%20Soc%20Res%20Adm26,%2021.pdf)

Abstract: This paper describes a research management activity, Technology Opportunities Analysis (TOA), undertaken at The Georgia Institute of Technology (Georgia Tech) to identify and assess the implications of emerging scientific areas and new research technologies. TOA aims to aid the university plan and prioritize research and educational efforts. The TOA process combines a number of activities in the quest for technology planning information: (1) monitoring various literatures, (2) analyzing various funding trends, (3) analyzing bibliometric materials, (4) networking with experts, (5) assessing the implications of emerging technologies to present university capabilities, core competencies, gaps, and educational objectives, and (6) analyzing policy and action options. During its first year, the TOA process focused on seven high-profile technologies. Experiences encountered in setting up the TOA process are discussed and strong and weak points are presented.

Keywords: Assessing, Bibliometric, Competencies, Core Competencies, Emerging Technologies, Experts, First, Funding, Georgia, Information, Management, Monitoring, Options, Planning, Policy, Research, Technologies, Technology, Trends, University

# Title: SRELS Journal of Information Management

Full Journal Title: SRELS Journal of Information Management

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0972-2467

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Vijayakumar, M. and Shehbaz, H. (2002), Authorship trend in Azadirachta Indica literature: A bibliometric study. *SRELS Journal of Information Management*, **39** (4), 445-455.

Abstract: Studies the authorship pattern of Azadirachta Indica literature. The study revealed that the collaborative research is more favoured than the solo research. The degree of collaboration in Azadirachta Indica literature is 0.9402.

Keywords: Authorship, Authorship Pattern, Bibliometric, Bibliometric Study, Collaboration, Collaborative Research, Literature, Pattern, Research, Trend

? Senthilkumaran, P. and Vadivel, V. (2004), *Journal of Spices and Aromatic Crops*: A bibliometric appraisal. *SRELS Journal of Information Management*, **41** (1), 121-132.

Abstract: Bibliometric study of the ‘Journal of Spices and Aromatic Crops’ for the period 1992-2000 is analyzed to understand the various characteristics of literature on the subject. Based on collected data, the study attempts to examine the year wise distribution of articles, authorship pattern, length of articles, subject wise breakup of articles and leading authors. Some inferences are also suggested based on the output of the analysis.

Keywords: Analysis, Authors, Authorship, Authorship Pattern, Bibliometric, Characteristics, Data, Distribution, Length, Literature, Pattern

? Krishna, K. and Kumar, S. (2004), Authorship trends in agriculture research: A bibliometric analysis. *SRELS Journal of Information Management*, **41** (2), 229-234.

Abstract: A case study of citations analysis of 68 doctoral theses on agriculture and veterinary sciences submitted to Rajasthan Agriculture University, Bikaner, during 1996 to 2000 for analysis of subjectwise authorship pattern and trend graph for books and journals is made and reported.

Keywords: Agriculture, Analysis, Authorship, Authorship Pattern, Bibliometric, Bibliometric Analysis, Case Study, Citations, Journals, Pattern, Rajasthan, Research, Sciences, Trend, Trends, Veterinary

? Mahapatra, R. and Panda, K. (2004), Health research literature on Orissa: A bibliometric analysis. *SRELS Journal of Information Management*, **41** (4), 383-392.

Abstract: Vividly describes the growth trend in health science literature on Orissa published from 1993-2002. Includes in its scope 118 research papers on ‘health literature’ from 59 Indian and foreign journals. Analyses the data by their authorship pattern, year wise growth subject wise break up of papers, category of journals, country of origin, length of papers, and ranking of journals.

Keywords: Analysis, Authorship, Authorship Pattern, Bibliometric, Bibliometric Analysis, Country, Country of Origin, Data, Growth, Health, Journals, Length, Literature, Origin, Papers, Pattern, Ranking, Research, Science, Scope, Trend

? Kumar, S. and Kumar, S. (2005), A bibliometric study of the *Journal of Oilseeds Research*, since 1993-2001. *SRELS Journal of Information Management*, **42** (3), 305-334.

Abstract: Analyses 743 research papers comprising 435 main articles and 308 short communications published (Total 743) in nine volumes 10 to 18, (1993-2001) in Journal of Oilseed Research (JOR), based on earlier study covering Vol. 1-9 (1984 to 1992) comprising 241 main articles and 257 short communications (Total 498 papers). The study gives status of oilseed research and importance of oilseeds in India. Also gives account of JOR, objectives and methodology of this study. Analyses papers into year wise distribution, length of articles, use of tables, graphs diagrams. Finds authorship pattern and calculates collaboration coefficients. Also finds out prolific contributors, location of papers, subject wise distribution and crop wise distribution. The paper analyses in details citations given in these articles in various tables viz number of citations per article and types of documents used for citations. Paper also ranks periodicals and apply Brodford Law.

Keywords: Analyses, Authorship, Authorship Pattern, Bibliometric, Bibliometric Study, Citations, Collaboration, Communications, Distribution, India, Length, Location, Methodology, Papers, Pattern, Periodicals, Research, Status

? Kademani, B., Kumar, V., Mohan, L., Sagar, A., Kumar, A., Gaderao, C. and Sunvase, G. (2006), Scientometric dimensions and publication productivity of the Analytical Chemistry Division at Bhabha Atomic Research Centre. *SRELS Journal of Information Management*, **43** (1), 5-20.

Abstract: This study tried to highlight quantitatively the contributions made by the scientists of Analytical Chemistry Division at BARC during 1972-2003. The Analytical Chemistry Division is primarily a service oriented division and every analysis of samples they receive did not always result in publications. This aspect also has to be taken into consideration while comparing the publication productivity with other divisions or group in the institute. The analysis shows that the Analytical Chemistry Division has produced 724 publications in diverse areas of research such as other analytical techniques (283), electro chemistry (186), neutron activation analysis (114), Separation techniques (89) and thermal analysis and thermochemistry (52). The division published 22 papers in 1972. Highest number of publications (58) were produced in 2003. The collaboration trend among the analytical chemists towards multi-authored papers is indicative of the highly specialized areas of scientific work that they were engaged in. The most prolific authors identified in the study were/are holding important positions in Bhabha Atomic Research Centre/Department of Atomic Energy shows that publication productivity is one of the important indicators to identify the scientists for newer responsibilities. The publication behaviour of analytical chemists shows that they were highly selective in publishing their research results in highly specialized journals.

Keywords: Activation, Analysis, Analytical Techniques, Behaviour, Chemistry, Collaboration, Indicators, Journals, Papers, Productivity, Publication, Publications, Publishing, Research, Research Results, Responsibilities, Service, Techniques, Thermal Analysis, Trend, Work

? Angadi, M., Koganuramath, M., Kademam, B. and Kumbar, B. (2006), Publication productivity of Tata Institute of Social Sciences: A scientometric study. *SRELS Journal of Information Management*, **43** (4), 363-374.

Abstract: This study attempts to analyse quantitatively 358 publications published by the social scientists of Tata Institute of Social Sciences during 2001-2004 in various Departments and Research Units for authorship pattern and collaboration trend. The results indicate that 90.22% of papers were single authored followed by two authored papers - 5.86% and three authored papers $3.35%. Most prolific authors were Shalini Bharat (21), M. M. Koganuramath (18), Mallikarjun Angadi, (13), R. N. Sharma (13), Chhaya Datar, (12), Siva Raju, (12), and Sarthi Acharya, (10). The most preferred journals by the social scientists were: Economic and Political Weekly, Indian Journal of Social Work, and Indian Journal of Labour Economics, with four papers each. Publication Density observed in the present study was 1.46.

Keywords: Authorship, Authorship Pattern, Collaboration, Journals, N, Papers, Pattern, Productivity, Publications, Scientometric, Social, Trend

? Nazim, M. and Ahmad, M. (2007), Research trends in information literacy: A bibliometric study. *SRELS Journal of Information Management*, **44** (1), 53-62.

Abstract: This study presents a bibliometric analysis of scientific output in the area of ‘information literacy’ (IL), the aim being to offer an overview of research trends in this field and characterize its most important aspects and their evolution over the last quarter of the 20th century. The analysis makes use of LISA Plus database, the search being restricted to published journal articles and which contain the terms ‘information literacy’. The various analyses focus on the presentation of publications, frequencies and percentages, as well as the application of Bradford’s law of scattering and Lotka’s law.

Keywords: Analyses, Analysis, Application, Bibliometric, Bibliometric Analysis, Bibliometric Study, Database, Evolution, Field, Information, Journal, Journal Articles, Law, Literacy, Presentation, Publications, Research, Scattering, Scientific Output, Trends

? Shafi, S., Rather, R., Jan, R. and Shah, G. (2007), D-LIB magazine: A bibliometric study. *SRELS Journal of Information Management*, **44** (3), 271-278.

Abstract: This paper examines the articles published in on-line D-Lib magazine for authorship trend, contribution of teaching and professionals, country-wise contribution, degree of collaboration and productivity within different facets of digital/electronic libraries. The study carried out for this paper found that collaborative research is given priority over solo research. The degree of collaboration is found to be 0.66.The study further reveals more contribution from teaching community compared to professionals. Country-wise distribution reveals that most of the contribution comes from the USA and Germany while facet-wise distribution of articles depicts that most of the articles cover digital libraries and preservation followed by metadata/cataloguing.

Keywords: Authorship, Bibliometric, Bibliometric Study, Collaboration, Collaborative Research, Community, Digital Libraries, Distribution, Germany, Productivity, Research, Teaching, Trend, USA

# Title: Stability Constants of Metal-ion Complexes Part A: Inorganic Ligands

Pergamon Press, Oxford, New York, Toronto, Sydney, Paris and Frankfurt

Högfeldt, E. (1982), *Stability Constants of Metal-ion Complexes Part A: Inorganic Ligands*, Pergamon Press, Oxford, New York, Toronto, Sydney, Paris and Frankfurt.

# Title: Starch-Stärke

Full Journal Title: [Starch-Stärke](http://www3.interscience.wiley.com/cgi-bin/jhome/5007532)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0038-9056

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wing, R.E. (1996), Starch citrate: Preparation and ion exchange properties. *Starch-Stärke*, **48** (7-8), 275-279.

Full Text: 1996\Sta-Sta48, 275.pdf

Abstract: Starch was allowed to react thermochemically (oven versus drum drying-oven) with citric acid to potentially yield biodegradable products possessing high ion exchange capacity. Reaction variables studied were: starch type (amylose content 0-70%), pH (0.5-8.5), sodium level (0-3 moles), citric acid level (0.1-0.5 moles), reaction time, temperature (110-140°C) and sodium dihydrogen phosphate catalysis. Reaction efficiencies approaching 100% were achieved, while minimizing crosslinking and maximizing carboxyl content. Carboxyl content was determined and copper binding capacity at pH 4.5 was evaluated.

Keywords: Heavy-Metal Ions, Citric-Acid, Formaldehyde, Performance, Residues, Removal, Binding, Cotton

# Title: Starke

Full Journal Title: Starke

ISO Abbreviated Title: Starke

JCR Abbreviated Title: Starke

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Journal Country

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Publisher Address:

Subject Categories:

: Impact Factor

Notes: IIsotherm

? Nair, P.R.M., Patel, K.C. and Patel, R.D. (1976), Adsorption of amylose triacetate on porous adsorbents. *Starke*, **28** (8), 267-270.

Full Text: [1960-80\Starke28, 267.pdf](1960-80/Starke28,%20267.pdf)

Abstract: Adsorption studies of amylose triacetate from its chloroform solutions on porous adsorbents viz. calcium silicate, aluminium silicate, and cellulose powder have been carried out at 35°±0.05°C. The adsorption follows first order kinetics. The adsorption data have been analysed according to the Langmuir and Simha-Frisch-Eirich isotherms. Viscosity measurements of supernatant polymer solutions as a function of adsorption time indicate the preferential adsorption of low molecular weight material.

Keywords: Adsorption

# Title: Statistical Science

Full Journal Title: Statistical Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Stigler, S.M. (1994), Citation patterns in the journals of statistics and probability. *Statistical Science*, **9** (1), 94-108.

Full Text: [1994\Sta Sci9, 94.pdf](1994/Sta%20Sci9,%2094.pdf)

Abstract: This is a study of the use of citation data to investigate the role statistics journals play in communication within that field and between statistics and other fields. The study looks at citations as import-export statistics reflecting intellectual influence. The principal findings include: there is little variability in both the number and diversity of imports, but great variability in both the number and diversity of exports and hence in the balance of trade, there is a tendency for influence to flow from theory to applications to a much greater extent than in the reverse direction, there is little communication between statistics and probability journals. The export scores model is introduced and employed to map a set of journals’ bilateral intellectual influences onto a one-dimensional scale, and the Cox effect is identified as a phenomenon that can occur when a disciplinary paper attracts a large degree of attention from outside its discipline.

Keywords: Applications, Bibliometrics, Bradley-Terry Model, Citation, Citations, Diversity, Field, GINI Index, Herfindahl Index, Journals, Models, Quasi-Symmetry, Science, Simpsons Index, Statistics, Theory

# Title: Statistics in Medicine

Full Journal Title: Statistics in Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Campbell, M.J. and Julious, S.A. (1994), Statistics in medicine - Citations of papers in the 1st 10 years. *Statistics in Medicine*, **13** (1), 3-10.

Full Text: 1994\Sta Med13, 3.pdf

Abstract: All papers from Volume 1 of Statistics in Medicine were followed up in the Science Citation Index. There were 6.7 citations per paper in medical journals as opposed to 1.5 citations per paper in statistical journals, and overall there were 8.7 citations per paper. The average citation rate was lower than that of the first issue of Biometrics, published in the same year, but this was partly because of a greater proportion of zero-cited papers. Citations from medical journals increased annually, until about 5 years after publication, after which they remained steady. Volumes 2-6 of Statistics in Medicine and Volumes 29-33 of Biometrics, for the years 1983-87, were followed up for statistical, medical source of the citations. Citations for Volumes 2-4 of Statistics in Medicine were relatively low, but picked up by Volume 5. Biometrics had more citations from statistical sources than from medical, by contrast to Statistics in Medicine which had far more citations from medical sources than from statistical.

Keywords: Citation, Citations, Journals, Papers, Publication, Regression, Science Citation Index, Statistical

# Title: Statistics & Probability Letters

Full Journal Title: [Statistics & Probability Letters](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5672&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=880f3d1d735e2bad0ae604db688795f6)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Wimmer, G. and Altmann, G. (2001), A new type of partial-sums distributions. *Statistics & Probability Letters*, **52** (4), 359-364.

Full Text: [S\Sta Pro Let52, 359.pdf](S/Sta%20Pro%20Let52,%20359.pdf)

Abstract: Generalizing Brookes theoretical explorations of the Bradford law (J. DOC. 33 (1977) 180) and searching for law-like hypotheses (J. Quant. Linguistics 6 (1999) 188) in linguistics and musicology led to a new type of partial-sums distributions. Some properties of this class of distributions are investigated.

Keywords: Discrete Probability Distributions, Partial-Sums Distributions

# Title: Staub Reinhaltung der Luft

Full Journal Title: Staub Reinhaltung der Luft

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0039-0771

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Buhne, K.W., Langer, U. and Koln, W.S. (1981), Automatic evaluation of continuous emission-monitoring. *Staub Reinhaltung der Luft*, **41** (5), 175-183.

? Lindau, L. (1983), Mercury sorption to coal fly-ash. *Staub Reinhaltung der Luft*, **43** (4), 166-167.

# Title: Stem Cells

Full Journal Title: [Stem Cells](http://stemcells.alphamedpress.org/)

ISO Abbreviated Title: Stem Cells

JCR Abbreviated Title: Stem Cells

ISSN: 1066-5099

Issues/Year: 6

Journal Country United States

Language: English

Publisher: Alphamed Press

Publisher Address: 318 Blackwell St, Ste 260, Durham, NC 27701-2884

Subject Categories:

Biotechnology & Applied Microbiology: Impact Factor 7.924, 5/140 (2006)

Oncology: Impact Factor 7.924, 9/127 (2006)

Cell Biology: Impact Factor 7.924, 21/156 (2006)

Hematology: Impact Factor 7.924, 4/61 (2006)

? Tomita, M., Adachi, Y., Yamada, H., Takahashi, K., Kiuchi, K., Oyaizu, H., Ikebukuro, K., Kaneda, H., Matsumura, M. and Ikehara, S. (2002), Bone marrow-derived stem cells can differentiate into retinal cells in injured rat retina. *Stem Cells*, **20** (4), 279-283.

Full Text: [2002\Ste Cel20, 279.pdf](2002/Ste%20Cel20,%20279.pdf)

Abstract: It has recently been shown that bone marrow cells can differentiate into various lineage cells including neural cells in vitro and in vivo. We therefore examined whether bone marrow stem cells can differentiate into retinal neural cells in adult rats. PKH-67-labeled stem cell-enriched bone marrow cells (BMCs) were injected into the vitreous space of eyes in which the retinas had been mechanically injured using a hooked needle. Two weeks after the injection of these cells, immunohistochemical examinations were carried out. The stem cell-enriched BMCs had been incorporated and had differentiated into retinal neural cells in the injured retina. The stem cell-enriched BMCs had accumulated mainly in the outer nuclear layer around the injured sites. The incorporated cells expressed glial fibrillary acidic protein, calbindin, rhodopsin, and vimentin. These results raise the possibility that stem cell-enriched BMCs have the ability to differentiate into retinal neural cells, and that the injection of stem cell-enriched BMCs into the retina would help repair damaged retinal cells.

Keywords: Retinal Transplantation, BMT, BMSCs, Adult-Rat, In-Vivo, Brain, Transplantation, Mice, Engraftment, Progenitors, Integration, Expression, Astrocytes

# Title: Stereotactic and Functional Neurosurgery

Full Journal Title: Stereotactic and Functional Neurosurgery

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Georgiopoulos, M., Katsakiori, P., Kefalopoulou, Z., Ellul, J., Chroni, E. and Constantoyannis, C. (2010), Vegetative state and minimally conscious state: A review of the therapeutic interventions. *Stereotactic and Functional Neurosurgery*, **88** (4), 199-207.

Abstract: Background/Aims: The purpose of the present article is a systematic review of the proposed medical or surgical treatments in patients in chronic vegetative state (VS) or minimally conscious state (MCS), as well as of their mechanisms of action and limitations. Methods: For this review, we have agreed to include patients in VS or MCS having persisted for over 6 months in posttraumatic cases, and over 3 months in nontraumatic cases, before the time of intervention. Searches were independently conducted by 2 investigators between May 2009 and September 2009 in the following data-bases: MEDLINE, Web of Science and the Cochrane Library. The electronic search was complemented by cross-checking the references of all relevant articles. Overall, 16 papers were eligible for this systematic review. Results: According to the 16 eligible studies, medical management by dopaminergic agents (levodopa, amantadine), zolpidem and median nerve stimulation, or surgical management by deep brain stimulation, extradural cortical stimulation, spinal cord stimulation and intrathecal baclofen have shown to improve the level of consciousness in certain cases. Conclusion: The treatments proposed for disorders of consciousness have not yet gained the level of ‘evidence-based treatments’; moreover, the studies to date have led to inconclusiveness. The published therapeutic responses must be substantiated by further clinical studies of sound methodology. Copyright (C) 2010 S. Karger AG, Basel.

Keywords: Amantadine, Arousal, Brain, Cochrane, Coma, Consciousness, Copyright, Databases, Deep-Brain-Stimulation, Electrical-Stimulation, Injury, Intervention, Intrathecal Baclofen, Management, Medical, Medical Aspects, Methodology, Methods, Minimally Conscious State, Papers, Patient, Patients, Review, Science, Surgical, Systematic, Systematic Review, Treatment Outcome, Vegetative State, Web of Science, Zolpidem

# Title: Steroids

Full Journal Title: [Steroids](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5165&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=4663f237f28c07a2e977638273f38f32)

ISO Abbreviated Title: Steroids

JCR Abbreviated Title: Steroids

ISSN: 0039-128X

Issues/Year: 12

Journal Country United States

Language: English

Publisher: Elsevier Science Inc

Publisher Address: 655 Avenue of the Americas, New York, NY 10010

Subject Categories:

Biochemistry & Molecular Biology Endocrinology & Metabolism: Impact Factor

Adamczyk, M., Mattingly, P.G. and Reddy, R.E. (1997), An efficient stereoselective synthesis of 6-α-aminoestradiol-preparation of estradiol fluorescent-probes. *Steroids*, **62** (6), 462-467.

Full Text: [S\Steroids62, 462.pdf](S/Steroids62,%20462.pdf)

Abstract: 6-Oxoestradiol (2) was protected as its bis[ (2-trimethylsilylethoxy)methyl] ether (4) and converted to the corresponding oxime (4). The oxime (4) on reduction with zinc in ethanol afforded the bis-SEM ether of 6-α-aminoestradiol (5) in 96% epimeric excess. Subsequently, 5 was hydrolyzed with HF to 6-α-aminoestradiol (6) in good yield. The absolute stereochemistry of the amino group in 6 was established by NMR and confirmed by X-ray crystallography on the corresponding 4-bromobenzamide derivative (9). Treatment of amine (6) with 6 (t-butoxycarbonylamino)hexanoic acid succinimidyl ester (10) followed by hydrolysis produced the amine (12) with a C-6 linker. The fluorescent probes (7 and 13) were prepared from 6 and 12 respectively, in 54-60% yield and >99% purity. (C) 1997 Elsevier Science Inc.

Keywords: β-Estradiol, 6-α-Aminoestradiol, Fluorescent Probe for Estrogen-Binding Protein, Breast-Cancer, Estrogen, Immunoassays, Conjugate, Chemistry, Receptor, Binding

# Title: Stochastic Environmental Research and Risk Assessment

Full Journal Title: [Stochastic Environmental Research and Risk Assessment](http://www.springerlink.com/content/103283/?p=0403995b9afe4c2592192d5b87711db4&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sirin, H. and Marino, M.A. (2008), On the cumulant expansion up scaling of ground water contaminant transport equation with nonequilibrium sorption. *Stochastic Environmental Research and Risk Assessment*, **22** (4), 551-565.

Full Text: [2008\Sto Env Res Ris Ass22, 551.pdf](2008/Sto%20Env%20Res%20Ris%20Ass22,%20551.pdf)

Abstract: The laboratory-scale ground water transport equation with nonequilibrium sorption reaction subjected to unsteady, nondivergence-free, and nonstationary velocity fields is up-scaled to the field-scale by using the ensemble-averaged equations obtained from the cumulant expansion ensemble-averaging method. It is found that existing ensemble-averaged equations obtained with the help of the cumulant expansion method for the system of linear partial differential equations are not second-order exact. Although the cumulant expansion methodology is designed for noncommuting operators, it is found that there are still commudativity requirements that need to be satisfied by the functions and constants exist in the coefficient matrix of the system of ordinary, partial differential equations. A reversibility requirement, which covers the commudativity requirements, is also proposed when applying the cumulant expansion method to a system of partial differential equations, a partial differential equation. The significance of the new velocity correction obtained in this study due to the applied second-order exact cumulant expansion is investigated on a numerical example with a linear trend in the distribution coefficient. It is found that the effect of the new velocity correction can be significant enough to affect the maximum concentration values and the plume center of mass in the case of a trending distribution coefficient in a physically heterogeneous environment.

Keywords: Aquifers, Contaminant Transport, Cumulant Expansion, Distribution Coefficient, Environment, Functions, Ground Water Contaminant Transport, Heterogeneous Porous-Media, Methodology, Model, Nonequilibrium Sorption, Partial Differential Equations, Plume, Reactive Transport, Requirement, Scaling, Simulations, Solute Transport, Sorption, Stochastic Differential Equations, Stochastic-Analysis, Transport, Unsteady-Flow Conditions, Velocity-Fields, Water

# Title: Strahlentherapie und Onkologie

Full Journal Title: Strahlentherapie und Onkologie

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0179-7158

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lehrl, S. (1999), Evaluating scientific performances by impact factors - the right for equal chances. *Strahlentherapie und Onkologie*, **175** (4), 141-153.

Full Text: [1999\Str Onk175, 141.pdf](1999/Str%20Onk175,%20141.pdf)

Abstract: Background: Regularly the Institute of Scientific Information publishes the impact factor (LF) that plays an increasing role when the scientific quality of scientific performances of journals, single publications, scientists, and research groups have to be evaluated in order to support them. Questions: How valid is the IF assigned to journals, single publications, scientists, and research groups? Have all these the same chance to be evaluated? How can fairness of evaluation be increased? Can its validity be improved? Results: The value of IF equals the average number of citations per article published in the preceding 2 calender years in a journal. The criteria for selection of citing journals and of those with an ‘official’ IF are not fully explicated. Although the citations have no equal units of measurement, empirical findings confirm their pragmatic applicability. IF of journals and even the citation rates of its articles are skewedly distributed to right hand. Additionnally, the citation rates of the articles within a journal vary. Therefore, the IF of journals rarely equal the actual citation rates of their articles. Usually, IF overestimates the citation rate and quality of the articles. Its tendency not to recognize low and high quality even increases when IF is administered to individual scientists and small research groups, whereas it decreases in large research groups. Under the premise that the extent of scientific quality corresponds to the amount of information a paper adds to the state of science, language, actuality etc. are confounders because English, reviewing, biomedical, and actual articles have preferred citation rates. Conclusions: Evaluation of scientific performances by IF is to be restricted to journals and large research groups. Fairness demands comparisons to homogeneous journals with respect to confounders such as language, Principally, no journal should be excluded to obtain an IF if it fullfills the minimum criteria of an internationally communicating science. For this purpose they have to provide a title, key words, and an abstract in English, a peer review system etc. Often journals are the centre of science cultures that an able to generate research of highest levels. The users can contribute to increase the IF of ‘their’ journal and to we for the valid application of this indicator.

Keywords: Bibliometry, Citation-Classics, Clinical Physiology, Economics, Evaluation of Scientific Performance, Impact, Impact Factor, Indicators, Journal Impact, Nuclear-Medicine, Patterns, Peer Review, Publications, Quality, Quality Of Research, Research, Science, Scientific Journals

# Title: Strait Pharmaceutical Journal

Full Journal Title: [Strait Pharmaceutical Journal](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=HAIX&NaviLink=%e6%b5%b7%e5%b3%a1%e8%8d%af%e5%ad%a6)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1006-3765

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ying, X., He, W., Qi, Y. and Li, S.G. (2003), Research in a novel immunosuppressant FTY720: A bibliometric analysis. *Strait Pharmaceutical Journal*, **15** (6), 6-8.

Full Text: [2003\Str Pha J15, 6.pdf](2003/Str%20Pha%20J15,%206.pdf)

Abstract: It is summarized in the article that basic principle of photodynamic the rapy, comm only use dphotosens itizers and state of development, and the choice of light source. The developmental prospects of PDT have also been predicted.

Keywords: FTY720, Bibliometric Analysis, Immunosuppressant

# Title: Strategic Management Journal

Full Journal Title: [Strategic Management Journal](http://www3.interscience.wiley.com/cgi-bin/jhome/2144), [Strategic Management Journal](http://uk.jstor.org/journals/01432095.html), [Strategic Management Journal](http://proquest.umi.com/pqdweb?RQT=318&pmid=18413&cfc=1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0143-2095

Issues/Year:

Journal Country

Language:

Publisher: [John Wiley & Sons](http://uk.jstor.org/journals/jwiley.html)

Publisher Address:

Subject Categories:

: Impact Factor

Park, S.H. and Gordon, M.E. (1996), Publication records and tenure decisions in the field of strategic management. *Strategic Management Journal*, **17** (2), 109-128.

Full Text: [S\Str Man J17, 109.pdf](S/Str%20Man%20J17,%20109.pdf)

Abstract: To better define levels of accomplishment for publishing journal articles in strategic management, a bibliometric study was performed on the publication records of 96 doctorates in the field whose first post-degree job was in academics. By examining 20 journals that are outlets for research in strategic management, publication records were developed for each individual for the first 5-10 years following receipt of the doctoral degree. Two factors influenced the publication records of these new faculty. Having publications prior to receiving the doctorate and getting a first job at an institution with a graduate program in management were associated with more frequent publishing after an academic career began. As expected, the number of papers published was related to the likelihood of receiving tenure. However, despite the fact that they had produced more papers during the first 5 years than male faculty members and had higher citation rates, female faculty members were less likely to receive tenure. The findings are discussed in terms of institutional policy for hiring and evaluating new faculty

Keywords: Article, Bibliometric, Bibliometric Study, Business Policy Scholars, Career, Citation, Determinants, English, Forum, Journal, Journals, Patterns, Productivity, Psychology, Publication, Publishing, Research, Research Productivity, Tenure Decisions

Ramos-Rodríguez, A.R. and Ruíz-Navarro, J. (2004), Changes in the intellectual structure of strategic management research: A bibliometric study of the Strategic Management Journal, 1980-2000. *Strategic Management Journal*, **25** (10), 981-1004.

Full Text: [S\Str Man J25, 981.pdf](S/Str%20Man%20J25,%20981.pdf)

Abstract: The aim of this paper is to identify the works that have had the greatest impact on strategic management research and to analyze the changes that have taken place in the intellectual structure of this discipline. The methodology is based on the bibliometric techniques of citation and co-citation analysis which are applied to all the articles published in the *Strategic Management Journal* from its first issue in 1980 through 2000. Copyright © 2004 John Wiley & Sons, Ltd.

Keywords: Analysis, Author Cocitation Analysis, Bibliometric, Bibliometric Study, Bibliometric Techniques, Bibliometrics, Changes, Citation, Co-Citation, Co-Citation Analysis, Cocitation, Competitive Advantage, Diversification Strategy, Firm, First, Impact, Industry, Intellectual Structure, Knowledge, Local Search, Management, Methodology, Performance, Research, Resource-Based View, Strategic, Strategic Management, Strategic Management Research, Structure, Techniques

? Nerur, S.P., Rasheed, A.A. and Natarajan, V. (2008), The intellectual structure of the strategic management field: An author co-citation analysis. *Strategic Management Journal*, **29** (3), 319-336.

Full Text: [2008\Str Man J29, 319.pdf](2008/Str%20Man%20J29,%20319.pdf)

Abstract: This paper complements a recent study by Ramos-Rodriguez and Ruiz-Navarro (2004) that investigated the intellectual structure of the strategic management field through co-citation analysis. By using authors as the units of analysis and incorporating all the citations that are included in the Science Citation Index and the Social Science Citation Index, we trace the evolution of the intellectual structure of the strategic management field during the period 1980-2000. Using a variety of data analytic techniques such as multidimensional scaling, factor analysis, and Pathfinder analysis, we (1) delineate the subfields that constitute the intellectual structure of strategic management, (2) determine the relationships between the subfields, (3) identify authors who play a pivotal role in bridging two or more conceptual domains of research, and (4) graphically map the intellectual structure in two-dimensional space in order to visualize spatial distances between intellectual themes. The analysis provides insights about the influence of individual authors as well as changes in their influence over time. Copyright (C) 2007 John Wiley & Sons, Ltd.

Keywords: Analysis, Author Co-Citation Analysis, Authors, Bibliometrics, Citation, Citation Analysis, Citation Index, Citations, Co-Citation, Co-Citation Analysis, Cocitation, Cocitation Analysis, Discipline, Evolution, Factor Analysis, Field, Information Theory, Intellectual Structure, Journals, Management, Pathfinder Analysis, Research, Science, Science Citation Index, Social Science Citation Index, Strategic Management, Strategic Management Research, Systems

# Title: Strategies of the International Scientific Cooperation in South-East Europe

Full Journal Title: Strategies of the International Scientific Cooperation in South-East Europe

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rozhkov, S. and Ivancheva, L. (2000), International S&T cooperation in Black Sea environmental research: A complex bibliometric analysis. *Strategies of the International Scientific Cooperation in South-East Europe*, **30**, 162-170.

Abstract: The results of an analysis of the publication activity of scientists from different countries on the Black Sea environmental problems are discussed. Only publications in journals, indexed in Science Citation Index (SCI) have been considered. By methods of formal scientometric analysis, the most important publications in the field have been presented. the journals that publish the greatest number of papers on the considered problems the structure of international scientific communications, etc. This approach enables the identification of some “hot pots” and new trends in the scientific world concerning that sphere of consolidation of the efforts of scientists from different countries in solving the environmental problems of the region. Such information could support research currently being carried out, and could also initiate a submission of new international research projects in that important scientific field.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Citation, Citation Index, Countries, Field, Journals, Methods, Papers, Publication, Publication Activity, Publications, Research, Research Projects, SCI, Science, Science Citation Index, Scientific Field, Scientometric, Scientometric Analysis, Trends

? Kristapsons, J. and Gedina, K. (2000), International R&D cooperation in Eastern Europe after 1990: Bibliometric analysis. *Strategies of the International Scientific Cooperation in South-East Europe*, **30**, 171-183.

Abstract: We performed bibliometric analysis of cooperation quantity and quality for different countries and groups of countries (Eastern Europe, Central Europe, Southern Europe, the Baltics, etc.), main directions and links (countries) of cooperation and their changes. Trends in changes of past internal USSR contacts were studied. The impact of the respective scientific fields was taken into account, and comparisons were made with Western standards of international cooperation. Obstacles and problems of international cooperation, including the influence of political developments, etc., are discussed.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Central Europe, Collaboration, Countries, Eastern Europe, Europe, Impact, International Cooperation, Quality, R&D, Standards

# Title: Strojarstvo

Full Journal Title: Strojarstvo

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0562-1887

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Krajna, T. and Petrak, J. (2004), Bibliometric characteristics of the journal *Strojarstvo* in the period 1992-2001. *Strojarstvo*, **46** (1-3), 19-23.

Full Text: 2004\Strojarstvo46, 19.pdf

Abstract: The authorship, institution affiliation, bibliographic references and citations of all articles published in the journal Strojarstvo between 1992 and 2001 have been analysed. The results show: decrease in number of original articles over the analyzed period, institutionally homogenized authors pool, small number of citations received and all characteristics commonly shared by the other journals produced by small scientific communities.

Keywords: Affiliation, Authors, Authorship, Bibliometric, Bibliometrics, Characteristics, Citations, Communities, Institution, Journal, Journals, References, Small, Strojarstvo

# Title: Stroke

Full Journal Title: [Stroke](http://proquest.umi.com/pqdlink?Ver=1&Exp=09-17-2010&RQT=318&PMID=23419&clientId=43660), [Stroke](http://gateway.ut.ovid.com/gw1/ovidweb.cgi?QS2=434f4e1a73d37e8cd9ada7a51d6645c4f7341aac700f7fb0cc89ff040274b6062bcde6c502c236bcf05f6d77517e3ae2fb02fc19fbe70689b533aa154b1c9bd8792bbd70eb5b8c5cf91891c95900b7f6e145097907f1d549f1f214bba3a635ce8644e7b28429b8794)

ISO Abbreviated Title: Stroke

JCR Abbreviated Title: Stroke

ISSN: 0039-2499

Issues/Year: 12

Journal Country United States

Language: English

Publisher: Lippincott Williams & Wilkins

Publisher Address: 530 Walnut St, Philadelphia, PA 19106-3621

Subject Categories:

Clinical Neurology Peripheral Vascular Disease: Impact Factor

? Jeng, J.S., Chung, M.Y., Yip, P.K., Hwang, B.S. and Chang, Y.C. (1994), Extracranial carotid atherosclerosis and vascular risk-factors in different types of ischemic stroke in Taiwan. *Stroke*, **25** (10), 1989-1993.

Full Text: [1994\Stroke25, 1989.pdf](1994/Stroke25,%201989.pdf)

Abstract: Background and Purpose The clinical patterns of stroke and the angiographic distribution of cerebral atherosclerosis in Chinese people are different from those in whites. Studies relating carotid atherosclerosis and vascular risk factors to various types of stroke in Chinese people are lacking.

Methods Based on clinical information, we separated 367 stroke patients living in Taiwan into four subgroups: cortical infarction (CI), subcortical infarction (SCI), vertebrobasilar artery infarction (VBAI), and cardioembolic infarction (CEI). We assessed the extent and severity of extracranial carotid artery atherosclerosis in different types of ischemic stroke using duplex ultrasonography. Vascular risk factors and carotid atherosclerosis were then correlated with each subgroup of ischemic stroke.

Results Our data revealed that 32% of the CI subgroup, 3% of the SCI subgroup, 7% of the VBAI subgroup, and 21% of the CEI subgroup possessed severe carotid stenosis (greater than or equal to 50% stenosis or occlusion). The extent of atherosclerosis of extracranial carotid arteries, measured by plaque score, was also more severe in the CI subgroup than in the other subgroups. Diabetes mellitus was more frequent in the CI subgroup. Cardiomegaly and left ventricular hypertrophy were more commonly seen in the CEI subgroup. The VBAI subgroup was younger than the other subgroups. There were no differences in hypertension, prior stroke, alcohol intake, or serum levels of glucose, uric acid, hematocrit, lipids, and lipoproteins among the subgroups.

Conclusions of the Chinese patients living in Taiwan, the extent and severity of extracranial carotid artery atherosclerosis were more prominent in patients with CI than in patients with other types of ischemic stroke. In Chinese patients with CI, severe carotid stenosis is not uncommon, in Chinese patients with SCI, however, the frequency of carotid stenosis is quite low.

Keywords: Atherosclerosis, Carotid Arteries, Cerebrovascular Disorders, Chinese, Stenosis, Occlusive Cerebrovascular-Disease, B-Mode Ultrasound, Lacunar Infarction, Arterial-Disease, Stenosis, System, Pathogenesis, Lipoproteins, Angiography, Registry

Yang, C.Y. (1998), Calcium and magnesium in drinking water and risk of death from cerebrovascular disease. *Stroke*, **29** (2), 411-414.

Full Text: [S\Stroke29, 411.pdf](S/Stroke29,%20411.pdf)

Abstract: BACKGROUND AND PURPOSE: Many studies have demonstrated a negative association between mortality from cardiovascular or cerebrovascular diseases and water hardness. This report examines whether calcium and magnesium in drinking water are protective against cerebrovascular disease.

METHODS: All eligible cerebrovascular deaths (17133 cases) of Taiwan residents from 1989 through 1993 were compared with deaths from other causes (17133 controls), and the levels of calcium and magnesium in drinking water of these residents were determined. Data on calcium and magnesium levels in drinking water throughout Taiwan were obtained from the Taiwan Water Supply Corporation. The control group consisted of people who died from other causes, and the controls were pair matched to the cases by sex, year of birth, and year of death.

RESULTS: The adjusted odds ratios (95% confidence interval) were 0.75 (0.65 to 0.85) for the group with water magnesium levels between 7.4 and 13.4 mg/L and 0.60 (0.52 to 0.70) for the group with magnesium levels of 13.5 mg/L or more. After adjustment for magnesium levels in drinking water, there was no difference between the groups with different levels of calcium.

CONCLUSIONS: The results of the present study show that there is a significant protective effect of magnesium intake from drinking water on the risk of cerebrovascular disease. This is an important finding for the Taiwan water industry and human health.

Keywords: Calcium, Cerebrovascular Disorders, Magnesium, Mortality, Cardiovascular Mortality, Blood-Pressure, United-States, Hardness, Hypertension

? Brilstra, E.H., Rinkel, G.J.E., van der Graaf, Y., van Rooij, W.J.J. and Algra, A. (1999), Treatment of intracranial aneurysms by embolization with coils - A systematic review. *Stroke*, **30** (2), 470-476.

Full Text: [1999\Stroke30, 470.pdf](1999/Stroke30,%20470.pdf)

Abstract: Background-Embolization with coils is increasingly used for the treatment of intracranial aneurysms. To assess the percentage of complications, the percentage of aneurysm occlusion, and the short-term outcome, we performed a systematic review of studies on embolization with controlled detachable or pushable coils. Summary of Review-To find studies on embolization with coils, we performed a MEDLINE search from January 1990 to March 1997, checked all reference lists of the studies found, performed a Science Citation Index search on Guglielmi, and hand searched recent volumes of 25 journals. Two authors independently extracted data by means of a standardized data extraction form from 48 eligible studies totalling 1383 patients. permanent complications of embolization with controlled detachable coils occurred in 46 of 1256 patients (3.7%, 95% CI, 2.7% to 4.9%), 400 of 744 aneurysms (54%, 95% CI, 50% to 57%) were completely occluded. By means of weighted linear regression, no relation between baseline characteristics and outcome measurements was found. The results in the prespecified subgroups of patients with a ruptured aneurysm, an unruptured aneurysm, or a basilar bifurcation aneurysm were essentially the same as the overall results. Conclusions-Short-term results indicate that embolization with coils is a reasonably safe treatment for patients with an unruptured aneurysm and for patients with aneurysmal subarachnoid hemorrhage. The effectiveness in terms of complete occlusion of the aneurysm is moderate. Randomized trials are warranted to compare surgical clipping with embolization with coils.

Keywords: Artery Aneurysms, Basilar Tip Aneurysms, Bifurcation, Cerebellar Artery, Cerebral Aneurysm, Characteristics, Citation, Effectiveness, Embolization,Therapeutic, Endovascular Therapy, Endovascular Treatment, Giant Aneurysms, Guglielmi Detachable Coils, Journals, Linear Regression, Medline, Occlusion, Platinum Coils, Regression, Review, Science, Science Citation Index, Spiral Coils, Systematic Review, Treatment, Treatment Outcome, Visual-Loss

? Holloway, R.G., Benesch, C.G., Rahilly, C.R. and Courtright, C.E. (1999), A systematic review of cost-effectiveness research of stroke evaluation and treatment. *Stroke*, **30** (7), 1340-1349.

Full Text: [1999\Stroke30, 1340.pdf](1999/Stroke30,%201340.pdf)

Abstract: Background and Purpose-This work was undertaken to review research addressing the cost-effectiveness of stroke-related diagnostic, preventive, or therapeutic interventions. Methods-We performed searches of MEDLINE, Excerpta Medica online, HealthSTAR, and Sciences Citation Index Expanded and examined the reference lists of the studies and reviews obtained. From these, we selected studies that reported an incremental analysis of cost per effect, in which the effect measure was life-years or quality-adjusted life-years. We abstracted data from each study using a standardized reporting form. Twenty-six articles met the eligibility criteria and were included in the review. Results-The methodological quality of the articles reviewed has improved compared with previously reported. Many stroke evaluation and treatment policies may result in benefits to health that are considered worth their cost. Some interventions were considered cost-ineffective (anticoagulation in low-risk nonvalvular atrial fibrillation and surveillance with duplex ultrasound after endarterectomy). Different studies addressing the cast-effectiveness of screening asymptomatic carotid stenosis resulted in strikingly divergent conclusions, from being cost-effective to being detrimental. Other studies omitted important costs that, if included, would likely have had profound impact on their cost-effectiveness estimates. Conclusions-Given the divergent conclusions drawn from studies addressing similar questions, it may be premature to use the results of cost-effectiveness research in developing stroke policy and practice guidelines. Successful implementation of such evaluations in the care of patients with stroke will depend on further standardization of methodology and critical appraisal of reported findings.

Keywords: Analysis, Anticoagulation, Atrial Fibrillation, Care, Cost, Cost Effectiveness, Cost-Effective, Cost-Effectiveness, Costs, Criteria, Data, Developing, Estimates, Evaluation, Guidelines, Health, Impact, Implementation, Interventions, Low Risk, Measure, MEDLINE, Methodology, Patients, Policies, Policy, Practice, Practice Guidelines, Premature, Quality, Quality of, Reporting, Research, Review, Reviews, Screening, Standardization, Stroke, Surveillance, Systematic Review, Therapeutic, Treatment, Ultrasound, Work

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Full Text: [2003\Stroke34, 2537.pdf](2003/Stroke34,%202537.pdf)

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Full Text: [2005\Stroke36, 905.pdf](2005/Stroke36,%20905.pdf)

Abstract: Background and Purpose - Endovascular treatment of atherosclerotic carotid artery stenosis may be an alternative to surgical endarterectomy. To evaluate the safety and efficacy of endovascular techniques, we conducted a systematic review of randomized studies that compared endovascular treatment with surgery for carotid stenosis. Methods - We searched the Cochrane Stroke Group trials register, the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, and Science Citation Index for randomized trials of carotid angioplasty and/or stenting compared with surgery. We also contacted researchers in the field and balloon catheter and stent manufacturers. Results - Five trials involving 1269 patients were included. Analysis of 30- day safety data found no significant difference in the odds of treatment-related death or any stroke (odds ratio [ OR], endovascular surgery, 1.33, 95% confidence interval [CI], 0.86 to 2.04), death or disabling stroke (OR, 1.22, CI, 0.61 to 2.41), or death, any stroke, or myocardial infarction (OR, 1.04, CI, 0.69 to 1.57). At 1 year after randomization, there was no significant difference between the 2 treatments in the rate of any stroke or death (OR, 1.01, CI, 0.71 to 1.44). Endovascular treatment significantly reduced the risk of cranial nerve injury (OR, 0.13, CI, 0.06 to 0.25). There was substantial heterogeneity between the trials for 4 of the 5 outcomes. Conclusions - No significant difference in the major risks of treatment was found but the wide confidence intervals indicate that it is not possible to exclude a difference in favor of one treatment. Minor complication rates favor endovascular treatment. There is currently insufficient evidence to support a widespread change in clinical practice away from recommending carotid endarterectomy as the treatment of choice for suitable carotid artery stenosis. Patients suitable for carotid endarterectomy should only be offered stenting within the ongoing randomized trials of stenting versus surgery.

Keywords: Angioplasty, Carotid Endarterectomy, Carotid Stenosis, Cerebral Protection, Change, Citation, Complications, Devices, Disease, Endarterectomy, Heterogeneity, Immediate, Medline, Outcomes, Percutaneous Transluminal Angioplasty, Protocol, Researchers, Review, Risk, Science, Science Citation Index, Stents, Stroke, Stroke Prevention, Surgery, Systematic Review, Techniques, Trans-Luminal Angioplasty, Treatment, Trial

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Full Text: [2004\Stroke35, E318.pdf](2004/Stroke35,%20E318.pdf)

Keywords: Outcome, Randomized Controlled Trials, Rehabilitation, Stroke, Stroke Rehabilitation

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Full Text: [2005\Stroke36, 905.pdf](2005/Stroke36,%20905.pdf)

Abstract: Background and Purpose - Endovascular treatment of atherosclerotic carotid artery stenosis may be an alternative to surgical endarterectomy. To evaluate the safety and efficacy of endovascular techniques, we conducted a systematic review of randomized studies that compared endovascular treatment with surgery for carotid stenosis. Methods - We searched the Cochrane Stroke Group trials register, the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, and Science Citation Index for randomized trials of carotid angioplasty and/or stenting compared with surgery. We also contacted researchers in the field and balloon catheter and stent manufacturers. Results - Five trials involving 1269 patients were included. Analysis of 30- day safety data found no significant difference in the odds of treatment-related death or any stroke (odds ratio [ OR], endovascular surgery, 1.33; 95% confidence interval [CI], 0.86 to 2.04), death or disabling stroke (OR, 1.22; CI, 0.61 to 2.41), or death, any stroke, or myocardial infarction (OR, 1.04; CI, 0.69 to 1.57). At 1 year after randomization, there was no significant difference between the 2 treatments in the rate of any stroke or death (OR, 1.01; CI, 0.71 to 1.44). Endovascular treatment significantly reduced the risk of cranial nerve injury (OR, 0.13; CI, 0.06 to 0.25). There was substantial heterogeneity between the trials for 4 of the 5 outcomes. Conclusions - No significant difference in the major risks of treatment was found but the wide confidence intervals indicate that it is not possible to exclude a difference in favor of one treatment. Minor complication rates favor endovascular treatment. There is currently insufficient evidence to support a widespread change in clinical practice away from recommending carotid endarterectomy as the treatment of choice for suitable carotid artery stenosis. Patients suitable for carotid endarterectomy should only be offered stenting within the ongoing randomized trials of stenting versus surgery.

Keywords: Angioplasty, Carotid Endarterectomy, Carotid Stenosis, Cerebral Protection, Change, Citation, Complications, Devices, Disease, Endarterectomy, Heterogeneity, Immediate, Medline, Outcomes, Percutaneous Transluminal Angioplasty, Protocol, Researchers, Review, Risk, Science, Science Citation Index, Stents, Stroke, Stroke Prevention, Surgery, Systematic Review, Techniques, Trans-Luminal Angioplasty, Treatment, Trial

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Full Text: [2006\Stroke37, 1933.pdf](2006/Stroke37,%201933.pdf)

Abstract: Background and Purpose-Hypertension promotes carotid intima-media thickening. We reviewed the randomized controlled trials that evaluated the effects of an antihypertensive drug versus placebo or another antihypertensive agent of a different class on carotid intima-media thickness. Methods-We searched the PUBMED and the Web of Science databases for randomized clinical trials. published in English before 2005, and included 22 trials. Results-In 8 trials including 3329 patients with diabetes or coronary heart disease, antihypertensive treatment initiated with an angiotensin-converting enzyme (ACE) inhibitor, a beta-blocker, or a calcium-channel blocker (CCB), compared with placebo or no-treatment, reduced the rate of intima-media thickening by 7 mu m/year (P = 0.01). In 9 trials including 4564 hypertensive patients, CCBs, ACE inhibitors, an angiotensin II receptor blocker or an alpha-blocker, compared with diuretics or beta-blockers, in the presence of similar blood pressure reductions, decreased intima-media thickening by 3 mu m/year (P = 0.03). The overall beneficial effect of the newer over older drugs was largely attributable to the decrease of intima-media thickening by 5 mu m/year (P = 0.007) in 4 trials of CCBs involving 3619 patients. In 5 trials including 287 patients with hypertension or diabetes, CCBs compared with ACE inhibitors did not differentially affect blood pressure, but attenuated intima-media thickening by 23 mu m/year (P = 0.02). The treatment induced changes in carotid intima-media thickness correlated with the changes in lumen diameter (P = 0.02), but not with the differences in achieved C, blood pressure (P > 0.53). Conclusions-CCBs reduce carotid intima-media thickening. This mechanism might contribute to their superior protection against stroke.

Keywords: Amlodipine, Arterial-Wall, Atherosclerosis, Blood, Blood Pressure, Blood-Pressure, Carotid Arteries, Clinical Trials, Converting Enzyme-Inhibition, Coronary Heart Disease, Databases, Diabetes, Disease, Double-Blind, Drug, Drugs, Fosinopril, Hypertension, Induced, Mechanism, Meta-Analysis, Patients, Pravastatin, Pressure, Progression, Pubmed, Randomized Clinical Trials, Randomized Controlled Trials, Science, Stroke, Treatment, Web of Science

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Full Text: [2007\Stroke38, 3070.pdf](2007/Stroke38,%203070.pdf)

Abstract: Background and Purpose - Interleukin- 6 (IL- 6) is associated with atherosclerotic disease and is also a key mediator in the inflammatory response to cerebral ischemia. Although the IL- 6 -174G/ C promoter polymorphism has been associated with carotid artery atherosclerosis and coronary heart disease, its relation to ischemic stroke is unclear. This review summarizes the current literature and discusses methodological considerations for future studies. Methods - Electronic searches were conducted in the PUBMED MEDLINE, Scopus, and ISI Web of Science databases. Two investigators independently reviewed all abstracts to identify studies examining the association between the IL- 6 - 174G/ C polymorphism and ischemic cerebrovascular events. Results - Twelve relevant publications were identified. Three reported on a subset of patients from a later publication, leaving 9 independent studies. Two studies found an association between ischemic stroke and the G allele or GG genotype, whereas 4 found an association with the C allele or CC genotype. One study found the CC genotype to be significantly less frequent in retinal artery occlusion patients. Two studies found no association between the - 174G/ C polymorphism and stroke. Conclusions - Studies investigating stroke and the - 174G/ C polymorphism report conflicting results, which may reflect the complex physiology of IL- 6 and true differences between stroke subtypes and populations. However, interpretation of published results is hindered by methodological limitations, and greater rigor and consistency in future studies will help unravel the relationship between the - 174G/ C polymorphism and stroke.

Keywords: Acute Stroke, Brain Infarction, Cardiovascular-Disease, Carotid-Artery Atherosclerosis, Cerebrovascular Events, Coronary Heart Disease, Databases, Disease, G, C Polymorphism, Gene Promoter, Genetics, Inflammation, Interpretation, Ischemia, ISI, Isi Web of Science, Literature, Medline, Methods, Patients, Plasma-Levels, Polymorphism, Preceding Infection, Proinflammatory Cytokines, Publication, Publications, Pubmed, Review, Risk-Factor, Science, Scopus, Stroke, Systematic, Systematic Review, Web of Science

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Full Text: [2009\Stroke40, E424.pdf](2009/Stroke40,%20E424.pdf)

Abstract: Background and Purpose-Hyperglycemia may worsen outcome after aneurysmal subarachnoid hemorrhage. We performed a systematic review to investigate the relation between admission hyperglycemia and outcome after aneurysmal subarachnoid hemorrhage. Methods-We included cohort studies or clinical trials of patients with aneurysmal subarachnoid hemorrhage admitted within 72 hours that documented admission glucose levels or the rate of hyperglycemia. Outcome had to be assessed prospectively after 3 or more months. The overall mean glucose level was calculated by weighting for the number of patients included in each study. To calculate the effect size, we pooled the ORs and 95% 95% CIs of poor clinical outcome in patients with or without hyperglycemia. Results-We searched MEDLINE, EMBASE, Science Citation Index, and the bibliographies of relevant studies. We included 17 studies totaling 4095 patients. The mean admission glucose level was 9.3 mmol/L (range, 7.4 to 10.9 mmol/L, 14 studies, 3373 patients) and the median proportion of patients with hyperglycemia was 69% (range, 29 to 100, 16 studies, 3995 patients, cutoff levels of hyperglycemia, 5.7 to 12.0 mmol/L). The pooled OR (8 studies, 2164 patients) for poor outcome associated with hyperglycemia was 3.1 (95% CI, 2.3 to 4.3). Cutoff points for defining hyperglycemia varied across studies (6.4 to 11.1 mmol/L), but this had no clear effect on the observed OR for poor outcome. Conclusions-After aneurysmal subarachnoid hemorrhage, admission glucose levels are often high and hyperglycemia is associated with an increased risk of poor clinical outcome. A randomized clinical trial is warranted to study the potential benefit of glycemic control after aneurysmal subarachnoid hemorrhage. (Stroke. 2009, 40: e424-e430.).

Keywords: Citation, Clinical Outcome, Critically-Ill Patients, Glucose, Glucose-Levels, Hyperglycemia, Intensive Insulin Therapy, Ischemic-Stroke, Medline, Multivariate-Analysis, Myocardial-Infarction, Poor-Grade Patients, Poststroke Hyperglycemia, Randomized Clinical Trial, Randomized Controlled-Trial, Review, Risk-Factors, Science, Science Citation Index, Subarachnoid Hemorrhage, Systematic Review

# Title: Studia Biophysica

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JCR Abbreviated Title: Stud Biophys

ISSN: 0081-6337

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# Title: Studia Universitatis Babes-Bolyai Chemia

Full Journal Title: [Studia Universitatis Babes-Bolyai Chemia](http://chem.ubbcluj.ro/~studiachemia/ndxs/arch.html)

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Subject Categories:

: Impact Factor

? Burca, S., Vermesan, G., Bulea, C., Stanca, M., Bedelean, H. and Maicaneanu, A. (2007), Electroplating wastewater treatment using a Romanian bentonite. *Studia Universitatis Babes-Bolyai Chemia*, **52** (3), 155-164.

Full Text: [2007\Stu Uni Bab-Bol Che52, 155.pdf](2007/Stu%20Uni%20Bab-Bol%20Che52,%20155.pdf)

Abstract: In this study we considered the possibility to remove iron and zinc ions from electroplating wastewaters using a clay mineral (bentonite). We worked with a bentonite cropped from Valea Chioarului, Maramures County, Romania, deposit. The bentonite sample was characterised by means of surface specific area (BET), chemical analysis, X-ray diffraction, scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS) and Fourier transformed infrared (FTIR) spectroscopy. Electroplating wastewaters provided by SC BETAK SA Bistrita, with an initial iron and zinc content of 1100.7 g Fe-total/dm(3) and 126.8 g Zn2+/dm(3) respectively, and a pH of 0.5, were used. The heavy metal ions removal process was realised in a batch reactor (static regime) using a micronised bentonite sample (d < 4.5 mu m). This type of bentonite proved to be efficient in the iron and zinc ions removal (100% removal efficiency).

Keywords: Analysis, Aqueous-Solutions, Batch, Batch Reactor, Bed Reactors, Bentonite, BET, Chemical, Chemical Analysis, Clay, Clay Mineral, EDS, Efficiency, Electron Microscopy, Electroplating, Electroplating Wastewaters, Energy, FTIR, Heavy Metal, Heavy Metal Ions, Heavy-Metals, Ion Adsorption, Ions, Iron, Iron Ions, Metal, Metal Ions, Metal Ions Removal, Montmorillonite, Natural Zeolites, Nonionic Surfactants, pH, Phenol, Pillared Clay, Removal, Removal Efficiency, Romania, Scanning Electron Microscopy, SEM, Spectroscopy, Surface, Treatment, Wastewater, Wastewater Treatment, Wastewaters, Wet Peroxide Oxidation, X-Ray, X-Ray Diffraction, Zinc, Zinc Ions

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Full Text: [2008\Stu Uni Bab-Bol Che53, 143.pdf](2008/Stu%20Uni%20Bab-Bol%20Che53,%20143.pdf)

Abstract: The formation and characterization of nanostructured polyfunctional layers (films) based on protein adsorption at different fluid interfaces, such as air/water or oil/water interfaces, in the absence or in the presence of stearic acid are investigated. For instance, kinetics and thermodynamics of protein adsorption at the air/aqueous solutions were studied, thereby evidencing the protein surface active properties. The investigated protein was a globulin extracted and purified from aleurone cells of barley. The conjugated effect of protein and stearic acid simultaneous adsorption was also investigated, at the benzene/aqueous solutions interface. A stable mixed lipid and protein film has been formed by the co-adsorption of these biomolecules at liquid-liquid interface showing that the interaction between stearic acid and the protein is significant.

Keywords: Adsorption, Air-Water-Interface, Aleurone Cells, Beta-Lactoglobulin, Bovine Serum-Albumin, Characterization, Co-Adsorption, Films, Fluid Interfaces, FTIR, Interaction, Interface, Interfaces, Kinetic, Kinetics, Kinetics And Thermodynamics, Lipid, Nanoparticles, Oil, Water Interface, Protein, Solutions, Stearic Acid, Surface, Surface Rheology, Thermodynamic, Thermodynamics, Ultrafiltration

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Full Text: [2008\Stu Uni Bab-Bol Che53, 31.pdf](2008/Stu%20Uni%20Bab-Bol%20Che53,%2031.pdf)

Abstract: The main purpose of this research paper was to study the Cd2+ adsorption capacity of green algae from solutions of heavy metal in different concentrations. In this respect, experimental determinations were carried out using Scenedesmus opoliensis species to investigate the power of retention of green algae when it is used as natural biological filter. The adsorption processes was studied using three different concentrations, regime, at normal temperature and pH = 5.2. Heavy metal ion was namely 4.36 mg Cd2+/L, 12.70 mgCd(2+)/L and 20.49 mg Cd2+/L, in dynamic adsorbed up to a yield of 50-52% over an interval of no more than 120 minutes, with an important increase in the first 10 minutes. The retention capacity, Q(s), of algal material adsorbent grows from 0.67 mg Cd2+/g adsorbent for C-1= 4.36 mgCd/L to 3.28 mg Cd2+/g adsorbent for C-3=20.49 mgCd(2+)/L. The analytical method employed in this study is atomic absorption.

Keywords: Absorption, Adsorbent, Adsorption, Adsorption Capacity, Algae, Atomic Absorption Method, Bioaccumulation, Biological, Biosorption, Capacity, Cd2+, Dynamic, Experimental, First, Green Algae, Heavy Metal, Heavy Metal Ion, Interval, Metal, Natural, Normal, pH, Power, Purpose, Removal, Research, Retention, Scenedesmus Opoliensis Green Algae, Solutions, Species, Temperature, Toxicity

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Full Text: [2008\Stu Uni Bab-Bol Che53, 31.pdf](2008/Stu%20Uni%20Bab-Bol%20Che53,%2031.pdf)

Abstract: In the present work, biosorption of copper ions from aqueous solutions on a strain of *Saccharomyces cerevisiae*, collected from the waste of a brewing industry, was studied in batch system for a better understanding of biosorption isotherm equilibrium, as well as biosorption kinetics. The influence of different sorbent dosages on the sorption of copper ions was investigated. Freundlich and Langmuir isotherm models were used for interpreting the copper biosorption equilibrium and the isotherm constants (i.e., for Freundlich isotherm model, k = 10.454 and n = 3.017) were determined by experimental data. Freundlich adsorption isotherm (R2 = 0.9642) was found to be more suitable than the Langmuir isotherm (R2 = 0.8709) for correlation of equilibrium biosorption data. Kinetics of biosorption for copper ions was investigated using the first- and second-order models. The kinetic constants were also determined. Second-order kinetics (R2 = 0.9937 - 0.9996) was found to fit the experimental data better than the first- order model (R2 = 0.743).

Keywords: Adsorption, Biosoption, Copper, Freundlich and Langmuir Models, Removal, *Saccharomyces cerevisiae*, Sorption

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Full Text: [2008\Stu Uni Bab-Bol Che53, 31.pdf](2008/Stu%20Uni%20Bab-Bol%20Che53,%2031.pdf)

Abstract: Biosorption of heavy metal ion (Zn2+) by immobilized Saccharomyces cerevisiae cells was studied. The biosorbent that we studied was made from fresh Bakers’ yeast commercially available under beads form. We used three different initial concentrations of Zn2+ in solution, 129.60 mg Zn2+/L, 213.41 mg Zn2+/L and 304.88 mg Zn2+/L, for biosorption study in dynamic regime, at 25 degrees C and neutral pH. Adsorption yields, eta, and retention capacity, Q(s), were calculated and compared. From all the experimental data it can be concluded that using yeast as a biological filter the concentration of Zn2+ from synthetic samples was considerably reduced. UV/VIS spectroscopy was used for determination of the adsorption degree of Zn2+ from synthetic wastewater samples.

Keywords: Adsorption, Beads, Biological, Biosorbent, Biosorption, Biosorption, Cadmium, Capacity, Cobalt, Concentration, Data, Dynamic, Experimental, Heavy Metal, Heavy Metals, Heavy-Metals, Immobilization, Immobilized, Metal, Molecular Adsorption Method, pH, Removal, Retention, Saccharomyces Cerevisiae, Saccharomyces Cerevisiae Cells, Solution, Spectroscopy, Wastewater, Yeast, Zn2+

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Full Text: [2009\Stu Uni Bab-Bol Che54.pdf](2009/Stu%20Uni%20Bab-Bol%20Che54.pdf)

Abstract: A bentonite sample from Oraşul Nou deposit, (Transilvania, Romania), was used to remove heavy metal ions (Zn2+, Pb2+, Cd2+) from model monocomponent wastewaters. A representative sample of bentonite (ON) was characterised using, wet chemical analyses, XRD, BET and FTIR. The bentonite deposit from Orasul Nou formed by alteration of rhyolites and perlites. Mineralogically, they contain clay minerals (montmorillonite, and subordinately kaolinite, illite), cristobalite, carbonates, zeolites (clinoptilolite), iron oxi-hydroxides and relics of primary minerals such as quartz and feldspar. The bentonite sample was used as powder, (d < 0.2 mm), without any chemical treatment. We studied the influence of the working regime, static and dynamic, concentration, and solid: liquid ratio over the process efficiency. We used monocomponent synthetic wastewaters containing zinc, lead and cadmium ions. The bentonite sample proved to be efficient for the removal of the considered heavy metal ions, removal efficiencies up to 100% (lead and zinc removal) were reached. First-order, pseudo- second-order and Elovich models were used to study the adsorption kinetic of zinc ions on the bentonite sample.

Keywords: Adsorption, Adsorption Kinetic, Analyses, Bentonite, BET, Cadmium, Cadmium Ions, Cd2+, Chemical, Clay, Clay Minerals, Clinoptilolite, Concentration, Dynamic, Efficiency, Elovich, FTIR, Heavy Metal, Heavy Metal Ions, Illite, Ions, Iron, Kaolinite, Kinetic, Lead, Liquid, Metal, Metal Ions, Minerals, Model, Models, Montmorillonite, Pb2+, Primary, Pseudo Second Order, Quartz, Removal, Romania, Second Order, Second-Order, Treatment, Wastewaters, XRD, Zeolites, Zinc, Zn2+

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Full Text: [2009\Stu Uni Bab-Bol Che54.pdf](2009/Stu%20Uni%20Bab-Bol%20Che54.pdf)

Abstract: The biosorption of phenol from aqueous solution on non-living mycelial pellets of Phanerochaete chrysosporium was studied using batch technique with respect to pH, initial concentration and biomass dosage. Ph. chrysosporium was grown in a liquid medium with a simple constitution. The phenol biosorption studies on fungal biomass was carried out at an initial pH of 5. Adsorption kinetics was characterized at an initial concentration of 12.5, 25 and 50 mg/L in a suspension concentration of 5.0 g/L. The sorption process followed the second-order kinetics. Phenol adsorption isotherms were determinated on fungal biomass at biomass concentration of 1.0 and 5.0 g/L and initial pH of 5. The adsorption equilibrium of phenol from aqueous solutions by mycelial pellets could be well described with Freundlich equation. The adsorption capacity of phenol and the Freundlich constant decreased with increasing biomass concentration.

Keywords: 2,4-Dichlorophenol, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solution, Aqueous Solutions, Batch, Biomass, Biosorption, Capacity, Chlorophenols, Concentration, Equilibrium, Freundlich, Freundlich Constant, Freundlich Equation, Fungal Biomass, Isotherms, Kinetics, Liquid, Live, Mycelial Pellets, Non-Living, pH, Phanerochaete Chrysosporium, Phanerochaete Chrysosporium Biomass, Phenol, Phenol Adsorption, Removal, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Solutions, Sorption, Sorption Process, Suspension, Water Treatment

? Tertiş, M.C., Ionescu, F. and Jitaru, M. (2009), Equilibrium study on adsorption processes of 4-nitrophenol and 2,6-dinitrophenol onto granular activated carbon. *Studia Universitatis Babes-Bolyai Chemia*, **54** (3), 213-222.

Full Text: [2009\Stu Uni Bab-Bol Che54.pdf](2009/Stu%20Uni%20Bab-Bol%20Che54.pdf)

Abstract: Adsorption of 4-nitrophenol and 2, 6-dinitrophenol onto granular activated carbon has been studied. Adsorption experiments were carried out in a batch system and were followed by UV-Visible spectroscopy over a period of 120 min. Adsorption isotherms were derived at 25 degrees C and the isotherm data were treated according to Langmuir, Freundlich and Tempkin isotherm equations. The fitting of experimental data was tested and the parameters of these equations were determined. Based on the correlation coefficients both Langmuir and Freundlich models are suitable for the study (the squares of correlation coefficients are all > 0.97). Based on the values of normalized percent deviation P, the Freundlich model is suitable for 4-NP and the Langmuir model is suitable 2,6-DNP adsorption onto granular activated carbon type NORIT GAC 1240W (value of P less than 5). The calculated adsorption capacity values (q(max)) are: 277.77 mg g(-1) for 4-NP, respective 41.15 mg g(-1) for 2, 6-DNP.

Keywords: 4-Nitrophenol, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous-Solutions, Batch, Batch System, Capacity, Carbon, Correlation, Data, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Model, GAC, Granular Activated Carbon, Isotherm, Isotherm Equations, Isotherms, Langmuir, Langmuir Model, Model, Models, Nitrophenols, P, P-Nitrophenol, Phenolic-Compounds, Reactors, Spectroscopy, Value

? Varga, C., Marian, M., Peter, A., Boltea, D., Mihaly-Cozmuta, L. and Nour, E. (2009), Strategies of heavy metal uptake by phaseolus vulgaris seeds growing in metalliferous and non-metalliferous areas. *Studia Universitatis Babes-Bolyai Chemia*, **54** (3), 223-234.

Full Text: [2009\Stu Uni Bab-Bol Che54.pdf](2009/Stu%20Uni%20Bab-Bol%20Che54.pdf)

Abstract: This study focuses on the accumulation of metal ions (Pb2+, Zn2+, Cu2+, Fe2+) in Phaseolus vulgaris seeds (Fabaceae family) collected from metalliferrous / non-metalliferrous areas in Maramures County. By “metalliferous areas” we will understand following in this research paper only areas displaying such pollution, as opposite to the other areas, consequently labeled as “non-metalliferous”. Four different concentrations of metal ions were used and their imbibition’s degree into the seeds was investigated. The accumulation of metal ions in the seeds of P. vulgaris increases as the initial concentration of metal ions is higher. Even more, the seeds growing in non-metalliferous areas display a higher absorption of all metal ions, except the Fe2+, than the seeds growing in metalliferous areas. From an anatomical point of view, we have observed that regardless of concentration, the metal ions were able to penetrate the seed through the hilum, up to the coat.

Keywords: Absorption, Accumulation, Adsorption, Atomic Absorption Spectrometry, Concentration, Copper, Cu2+, Family, Germination, Habitats, Heavy Metal Accumulation, Ions, Iron, Iron, Lead, Lead, Metal, Metal Ions, Optical Microscopy, P, Pb2+, Phaseolus Vulgaris, Pollution, Research, Roots, Tolerance, Zinc, Zn2+

? Măicăneanu, A., Cotet, C., Danciu, V. and Stanca, M. (2009), Phenol removal from water using carbon aerogel as adsorbent. *Studia Universitatis Babes-Bolyai Chemia*, **54** (4), 33-42.

Full Text: 2009\Stu Uni Bab-Bol Che54.pdf

Abstract: This paper presents experimental results obtained in the process of phenol adsorption from synthetic wastewaters in batch conditions using a carbon aerogel (CA) as adsorbent. Influence of the phenol initial concentration and contact type over the process efficiency was studied. The carbon aerogel adsorbent was prepared by polycondensation of resorcinol and formaldehyde followed by drying in supercritical condition with liquid CO2 and a pyrolysis step. Morpho-structural characteristics of carbon aerogel were investigated using transmission electron microscopy (TEM), scanning electron microscopy (SEM), X-ray diffraction (XRD) and specific surface area determination using nitrogen adsorption (BET method). Obtained carbon aerogel proved to be an efficient adsorbent for phenol from wastewaters. Adsorption efficiencies up to 94.32% were reached.

Keywords: Adsorbent, Adsorption, Adsorption, Aerogel, Aqueous-Solution, Batch, BET, Capacity, Carbon, Carbon Aerogel, Characteristics, CO2, Concentration, Efficiency, Electron Microscopy, Equilibrium, Experimental, Formaldehyde, Liquid, Nitrogen, O-Chlorophenol, Phase, Phenol, Polymeric Adsorbents, Pyrolysis, Removal, Resins, Resorcinol, Scanning Electron Microscopy, SEM, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Surface Area Determination, Surfactant-Modified Bentonite, Tem, Transmission, Wastewaters, Water, X-Ray, X-Ray Diffraction, XRD

? Cornelia, M., Maicaneanu, A., Indolean, C., Burca, S. and Stanca, M. (2010), Phenol contaminated water remediation using commercial immobilized bentonites as adsorbents. *Studia Universitatis Babes-Bolyai Chemia*, **55** (1), 115-123.

Full Text: 2010\Stu Uni Bab-Bol Che55, 115.pdf

Abstract: This work presents experimental results obtained in the process of phenol removal from model solutions using batch technique (magnetic stirring, 100 ml solution). As adsorbent we used five commercial bentonites immobilized in calcium alginate beads. Influences of bentonite provenience and quantity (2-10 grams), and phenol concentration (31-160 mg/L) over the process efficiency were studied. The adsorption capacity decreases in order B5 (Fort Benton) > B2 congruent to B3 >= B4 > B1 (BW200). Also, adsorption capacity increased with a decrease in the bentonite quantity and an increase of the initial phenol concentration. Maximum adsorption capacity was calculated to be 2.2013 mg phenol/g.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Alginate, Alginate Beads, Batch, Beads, Bentonite, Bentonites, Calcium, Calcium Alginate, Capacity, Concentration, Efficiency, Experimental, Immobilized, Immobilized Bentonite, Magnetic, Model, Modified Montmorillonite, Phenol, Phenol Removal, Remediation, Removal, Solution, Solutions, Sorption, Water, Work

? Bogya, E.S., Bâldea, I., Barabás, R., Csavdári, A., Turdean, G. and Dejeu, V.R. (2010), Kinetic studies of sorption of copper(II) ions onto different calcium-hydroxyapatie materials. *Studia Universitatis Babes-Bolyai Chemia*, **55** (2), 363-373.

Full Text: [2010\Stu Uni Bab-Bol Che55.pdf](2010/Stu%20Uni%20Bab-Bol%20Che55.pdf)

Abstract: A study on the removal of copper ions from aqueous solutions by synthetic hydroxyapatite and structurally modified apatite has been carried on under batch conditions. The influence of different sorption parameters, such as heat treatment of the material, particle size, initial metal ion concentration and temperature has been studied and discussed. Maximum adsorption capacity and efficiency were determined. The results showed that the removal efficiency of Cu(II) by hyrdoxyapatite containing silica (HAP-Si) could reach 99.7%, when the initial Cu(II) concentration was 5 mM. The mechanism of the sorption process was studied, by employing pseudo-first, pseudo-second-order kinetic models and intraparticle diffusion model. Activation energy for hydroxyapatite and 10%(wt) silica doped hydroxyapatite was obtained, considering pseudo-second-order kinetics model.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Capacity, Apatite, Aqueous Solutions, Batch, Cadmium, Capacity, Concentration, Copper, Copper Removal, Cu(II), Diffusion, Diffusion Model, Efficiency, Energy, Heat-Treatment, Hydroxyapatite, Hydroxylapatite, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Kinetic, Kinetic Models, Kinetics, Kinetics Model, Mechanism, Metal, Model, Models, Modified, Modified Hydroxyapatite, Particle Size, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Removal Efficiency, Silica, Silicon-Substituted Hydroxyapatites, Size, Solutions, Sorption, Sorption Process, Temperature, Treatment

? Szende, T., Indolean, C., Burcă, S., Măicăneanu, A., Bela, K. and Majdik, C. (2010), Biosorption of Cd2+ ions by immobilized cells of *Saccharomyces cerevisiae*. Adsorption equilibrium and kinetic studies. *Studia Universitatis Babes-Bolyai Chemia*, **55** (3), 129-137.

Full Text: [2010\Stu Uni Bab-Bol Che55, 129.pdf](2010/Stu%20Uni%20Bab-Bol%20Che55,%20129.pdf)

Abstract: Biosorption of cadmium (II) ions from aqueous solution onto immobilized cells of *Saccharomyces cerevisiae* was investigated. Equilibrium and kinetic studies were conducted taking into consideration the effect of initial cadmium (II) concentration. The obtained results showed that the uptake of heavy metal increases with an increase of initial cadmium (II) concentration. Langmuir and Freundlich isotherm models were used to analyze the equilibrium data. Based on correlation coefficients, it has been concluded that the Langmuir isotherm is more suitable to describe the cadmium biosorption equilibrium data. First and pseudo-second order kinetic models were applied to describe the biosorption process. It was found that the kinetics data fitted well the pseudo second order model.

Keywords: Adsorption, Adsorption Isotherm, *Aspergillus-niger*, Bakers-Yeast, Biosorption, Cadmium, Cadmium, Equilibrium, Freundlich, Freundlich Isotherm, Fungus Trametes-Versicolor, Heavy-Metals, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Removal, *Saccharomyces cerevisiae*, *Saccharomyces cerevisiae* Cells

? Popa, C., Bulai, P. and Macoveanu, M. (2011), Equilibrium and kinetic studies of iron(II) removal from 34% calcium chloride solutions by chelating resin purolite S930. *Studia Universitatis Babes-Bolyai Chemia*, **56** (1), 129-143.

Full Text: 2011\Stu Uni Bab-Bol Che56, 129.pdf

Abstract: This work presents equilibrium, thermodynamic and kinetic studies of iron removal from 34% CaCl2 solution (that was obtained from electrolysis sludges) using chelating resin Purolite S930 with iminodiacetic acid functional groups. Batch sorption experiments were performed using both forms of the resin (S930-Na and S930-H) by varying the initial conditions such as initial solution pH (2.0-5.0), initial concentration of iron (20-400 mg/L), solution temperature (22-40ºC) and contact time (10 minutes up to 24 hours). The practical capacity of the resin increases with initial solution pH, temperature and the initial concentration of iron(II). Freundlich constants (n) had values bigger than 1 for the whole range of temperature that was studied, so, the sorbtion of iron on Purolite S930-Na form resin is a favourable one. The values of correlation coefficients (R2) higher than 0,99 show that on the studied concentration (200-400mg Fe(II)/L) and temperature (295-313 K) range the data were more suitable to the LangmuirI model. The values obtained for the Langmuir (R(L)) constant (0 < R(L) < 1) show a favourable isotherme for the whole range of temperature that was studied (295-313 K). The maximum sorption capacity (q(max)) was 238 mg Fe(II)/g for pH5. The values of calculated thermodynamic parameters (ΔG(0), ΔH(0) and ΔS(0)) indicate that the sorption of iron onto Purolite S930 resin is an endothermic and spontaneous process. The kinetic data show that, initially, sorption increases rapidly, but after that, the rate becomes slower; the equilibrium can be considered attained after 24 hours. Kinetic studies reveal that the sorption of iron from 34% CaCl2 solution onto chelating resin follows a pseudo-second order model.

Keywords: Adsorption, Aqueous-Solutions, Batch, Chelating Resin, Equilibrium, Freundlich, Ions, Iron (II) Removal, Kinetic, Kinetics, Langmuir, pH, Pseudo Second Order, Purolite S 930, Removal, Resin, Sorption, Sorption Isotherm, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics

# Title: Studies in Conflict and Terrorism

Full Journal Title: [Studies in Conflict and Terrorism](http://taylorandfrancis.metapress.com/(4kbsrj55fs5hy2zo4k41yyej)/app/home/journal.asp?referrer=parent&backto=linkingpublicationresults,1:102492,1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gordon, A. (2004), The effect of database and website inconstancy on the terrorism field’s delineation. *Studies in Conflict and Terrorism*, **27** (2), 79-88.

Full Text: [2004\Stu Con Ter27, 79.pdf](2004/Stu%20Con%20Ter27,%2079.pdf)

Abstract: The often changing range of terrorism journals selected for indexing in various databases adds to the elasticity of this field’s definition. The electronic databases as well as websites change their format and content quite often and this instability hampers the formation of a clear delineation of the disciplinary boundaries of terrorism. Nevertheless, the integration of electronic databases into terrorism research has exposed researchers to a large number of journals that deal with various aspects of terrorism, and the boundaries of this subject are continually expanding to encompass new sub-areas. In addition to the known core journals covering terrorism, many peripheral journals are emerging that are concerned with the dynamics of this field. The exposure of researchers to such a massive amount of information, print and electronic, demonstrates a marked knowledge growth in this area of study. However, the field could become so broad, even before reaching disciplinary maturation, that it could defy any attempt at delineation.

# Title: Studies in Environmental Science

(SENSD, SEN, Stud. Environ. Sci.)

Full Journal Title: Studies in Environmental Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Jaroniec, M. and Derylo, A. (1982), Theory of single-solute and bi-solute adsorption from dilute aqueous solutions on activated carbon. *Studies in Environmental Science*, **19**, 361-368.

# Title: Studies in Higher Education

Full Journal Title: [Studies in Higher Education](http://www.informaworld.com/smpp/title~content=t713445574)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Colman, A.M., Garner, A.B. and Jolly, S. (1992), Research performance of United-Kingdom university psychology departments. *Studies in Higher Education*, **17** (1), 97-103.

Full Text: [1992\Stu Hig Edu17, 97.pdf](1992/Stu%20Hig%20Edu17,%2097.pdf)

Abstract: This scientometric investigation of research performance focuses on publications in seven leading European psychology journals. For the period 1980-89 inclusive, articles by members of university departments of psychology in the United Kingdom were counted, and the average number of articles per staff member was calculated for each department. The resulting research performance figures correlated positively and significantly with recent performance estimates by other researchers using different methods.

Keywords: Association, British, Counts, Institutional Research Productivity, Journals, Methods, Publication, Publications, Ratings, Research, Research Performance, Researchers, Scientometric, United Kingdom, University

? Walker, J. (2010), Measuring plagiarism: Researching what students do, not what they say they do. *Studies in Higher Education*, **35** (1), 41-59.

Full Text: [2010\Stu Hig Edu35, 41.pdf](2010/Stu%20Hig%20Edu35,%2041.pdf)

Abstract: Student plagiarism in colleges and universities has become a controversial issue in recent years. A key problem has been the lack of reliable empirical data on the frequency, nature and extent of plagiarism in student assignments. The aim of the study described here was to provide this data. Patterns of plagiarism were tracked in two university business studies assignments involving over 500 students and over 1000 scripts. Turnitin software was used to facilitate the identification of plagiarised material in assignments. The findings confirmed some common assertions about the nature of student plagiarism but did not provide support for a number of others.

Keywords: Assessment, Cheating, Perceptions, Plagiarism, Students, Turnitin, University

? Gullifer, J. and Tyson, G.A. (2010), Exploring university students’ perceptions of plagiarism: A focus group study. *Studies in Higher Education*, **35** (4), 463-481.

Full Text: [2010\Stu Hig Edu35, 463.pdf](2010/Stu%20Hig%20Edu35,%20463.pdf)

Abstract: Plagiarism is perceived to be a growing problem and universities are being required to devote increasing time and resources to combating it. Theory and research in psychology show that a thorough understanding of an individual’s view of an issue or problem is an essential requirement for successful change of that person’s attitudes and behaviour. This pilot study explores students’ perceptions of a number of issues relating to plagiarism in an Australian university. In the pilot study, focus groups were held with students across discipline areas, year and mode of study. A thematic analysis revealed six themes of perceptions of plagiarism: confusion, fear, perceived sanctions, perceived seriousness, academic consequences and resentment.

Keywords: Academic Dishonesty, Academic Integrity, Attitudes, Codes, College Students, College-Students, Contextual Influences, Motivation, Plagiarism, Research, Student Ethics, Students, University Student

? de Jager, K. and Brown, C. (2010), The tangled web: Investigating academics’ views of plagiarism at the University of Cape Town. *Studies in Higher Education*, **35** (5), 513-528.

Full Text: [2010\Stu Hig Edu35, 513.pdf](2010/Stu%20Hig%20Edu35,%20513.pdf)

Abstract: This article considers the problematic question of student plagiarism, its causes and manifestations, and how it is addressed in academic environments. A literature survey was conducted to establish how higher education institutions approach these issues, and a twofold investigation was conducted at the University of Cape Town. Data was gathered from the case records of the university disciplinary tribunals dealing with plagiarism, and a survey was conducted among academic staff to establish how they dealt with issues surrounding plagiarism and academic dishonesty. Academics seem unwilling to follow official university policies if they are perceived to be unrealistic.

Keywords: Academic Dishonesty, Academic Literacies, Academic Misconduct, Academic Writing, Academics, Education, Higher Education, Literature, Plagiarism, Policies, Survey, University, Writing Skills

# Title: Studies in Philosophy and Education

Full Journal Title: Studies in Philosophy and Education

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Bouville, M. (2010), Why is cheating wrong? *Studies in Philosophy and Education*, **29** (1), 67-76.

Full Text: [2010\Stu Phi Edu29, 67.pdf](2010/Stu%20Phi%20Edu29,%2067.pdf)

Abstract: Since cheating is obviously wrong, arguments against it (it provides an unfair advantage, it hinders learning) need only be mentioned in passing. But the argument of unfair advantage absurdly takes education to be essentially a race of all against all, moreover, it ignores that many cases of unfair (dis)advantages are widely accepted. On the other hand, the fact that cheating can hamper learning does not mean that punishing cheating will necessarily favour learning, so that this argument does not obviously justify sanctioning cheaters.

Keywords: Academic Dishonesty, Academic Dishonesty, Academic Integrity, Academic Misconduct, Cheating, College-Students, Education, Ethics, Grades, High-School, Homework, Intrinsic Motivation, Learning, Performance, Plagiarism, Plagiarism

? Fernandez, C. and Sundstrom, M. (2011), Citizenship education and liberalism: A state of the debate analysis 1990-2010. *Studies in Philosophy and Education*, **30** (4), 363-384.

Full Text: [2011\Stu Phi Edu30, 363.pdf](2011/Stu%20Phi%20Edu30,%20363.pdf)

Abstract: What kind of citizenship education, if any, should schools in liberal societies promote? And what ends is such education supposed to serve? Over the last decades a respectable body of literature has emerged to address these and related issues. In this state of the debate analysis we examine a sample of journal articles dealing with these very issues spanning a twenty-year period with the aim to analyse debate patterns and developments in the research field. We first carry out a qualitative analysis where we design a two-dimensional theoretical framework in order to systematise the various liberal debate positions, and make us able to study their justifications, internal tensions and engagements with other positions. In the ensuing quantitative leg of the study we carry out a quantitative bibliometric analysis where we weigh the importance of specific scholars. We finally discuss possible merits and flaws in the research field, as evidenced in and by the analysis.

Keywords: Autonomy, Bibliometric, Bibliometric Analysis, Citizenship Education, Civic Education, Diversity, Education, Environmental-Education, Journal, Justice, Legitimacy, Liberalism, Literature, Political Liberalism, Research, Rights, Schools, State of the Debate, Thick and Thin

# Title: Studies in Science of Science

Full Journal Title: [Studies in Science of Science](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=KXYJ&NaviLink=%e7%a7%91%e5%ad%a6%e5%ad%a6%e7%a0%94%e7%a9%b6)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1003-2053

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Zhang, G.L. and Chen, H.M. (2006), Research on national high-tech R＆D program assessment. *Studies in Science of Science*, **24** (1), 57-61.

? Hua, W.N. (2006), Scientometric study on scientific research capability in China on the first half of the 20th century. *Studies in Science of Science*, **24** (3), 332-341.

Full Text: [2006\Stu Sci Sci24, 332.pdf](2006/Stu%20Sci%20Sci24,%20332.pdf)

Abstract: This paper first searched for scientific research articles from the databases of ISI citation index in the period from 1900 to 1949. Then a large scale of bibliometric study wasmade from many aspects as amount, authors, organizations, subjects, core source journals and citations, in order to reflect and evaluate the scientific research capability in China on the first half of the 20th century.

Keywords: Research Assessment, Scientometric Study, Bibliometric Study, Citation Index, Research Productivity

# Title: Studies in Surface Science and Catalysis

Full Journal Title: [Studies in Surface Science and Catalysis](http://www.sciencedirect.com/science/bookseries/01672991)

ISO Abbreviated Title:

JCR Abbreviated Title: Stud Surf Sci Catal

ISSN: 0167-2991

Issues/Year:

Journal Country Netherlands

Language: English

Publisher: Elsevier Science Publ BV

Publisher Address: Sara Burgerhartstraat 25, PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Chemistry, Physical: Impact Factor 0.513, 79/91 (2000)

Miyahara, M. and Okazaki, M. (1994), A method for estimation of pore chaacteristics of solids immersed in a solvent based on the capillary phases-separation concept. *Studies in Surface Science and Catalysis*, **87**, 353-362.

Full Text: [1994\Stu Sur Sci Cat87, 353.pdf](1994/Stu%20Sur%20Sci%20Cat87,%20353.pdf)

? Dąbrowski, A. (1999), Adsorption - its development and application for practical purposes. *Studies in Surface Science and Catalysis*, **120** (1), 3-68.

Full Text: [1999\Stu Sur Sci Cat120, 3.pdf](1999/Stu%20Sur%20Sci%20Cat120,%203.pdf)

Keywords: Active Carbons, Adsorption, Binary-Liquid Mixtures, Carbonaceous Adsorbents, Development, Dubinin-Radushkevich Equation, Energy-Distribution, Heterogeneous Solid-Surfaces, Mixed-Gas Adsorption, Multicomponent Solutions, Physical Adsorption, Porous Silica-Gels

? Raya, M.S. (1999), Adsorption principles, design data and adsorbent materials for industrial applications: A bibliography (1967–1997). *Studies in Surface Science and Catalysis*, **120** (1), 977-1049.

Full Text: [1999\Stu Sur Sci Cat120, 977.pdf](1999/Stu%20Sur%20Sci%20Cat120,%20977.pdf)

Abstract: This chapter provides a bibliographic listing of published journal papers from 1967 to 1997 concerned with adsorbent materials, adsorption principles (theory and models), and design data which are used in industrial situations. The bibliography provides a quick and easy, but comprehensive, reference source. The references are taken from the fifty most important chemical engineering journals, but do not include papers from the chemistry journals, or books, or conference/symposium series. A listing of the journals surveyed is included at the end of this chapter. The references are arranged chronologically (and then alphabetically by first author surname) within the following subject groups: Fundamental Principles of Adsorption, Theory and Models Adsorption Design Methods and Data Adsorbent Materials The following topics, having an emphasis towards environmental protection, are included in a separate bibliography in Volume 2: PSA and Cyclic Systems, and Applications, Liquid-Phase Adsorption, Ion Exchange, Chromatography, and Related Separations.

A general bibliography of the chemical engineering journal literature from 1967-1988 has been published by the author [1], and can provide access to a wider range of topics. An earlier bibliography [2] provides access to the literature prior to 1967. A complete bibliographic listing of the chemical engineering journal literature from 1989 to 1997 (with subsequent six-monthly updates) is available on a CD-ROM database [3].

Keywords: Adsorption Theories, Isotherm Data, Adsorbents, Zeolites, Activated Carbons, Industrial Applications

? Vansant, E.F. (1999), New composite adsorbents for the removal of pollutants from waste waters. *Studies in Surface Science and Catalysis*, **120** (2), 381-396.

Full Text: [1999\Stu Sur Sci Cat120, 381.pdf](1999/Stu%20Sur%20Sci%20Cat120,%20381.pdf)

Abstract: Chemical modification techniques were developed to create new composite adsorbents from elutrilithe to improve the removal of neutral, anionic and cationic organic and inorganic pollutants from water. A chemical activation of the elutrilithe, resulting from reactions with metalsalts and gibbsite or boehmite at high temperature 700°C in the absence of oxygen, composite adsorbents were developed for an efficient treatment of waste waters. The activated products were characterised in terms of surface area, and micropore volume and evaluated in terms of affinity and capacity for a number of organic compounds. Relations between the organic compounds and their molecular size, pK (a) PH and adsorption temperature were investigated. The presence of gibbsite or boehmite during the modification process gives rise to a composite adsorbent suitable for the removal of anionic and cationic organic or inorganic compounds from waste water. Preliminary tests in pre-pilot installations confirmed the results obtained on lab scale. The preparation of the new composite adsorbent is cheap with an ease of handling. From comparative experiments, it was obvious that the modified elutrilithe adsorbents show a superior affinity and capacity compared to the classical excisting sorbents in the removal of pollutants from waste water.

Keywords: Polychlorinated Biphenyl, Hydrophobic Compounds, Suspended-Solids, Sorption, Adsorption, Sediments, Chlorophenols, Clays, Soils

? Heijman, S.G.J. and Hopman, R. (1999), Activated carbon filtration in drinking water production: New developments and concepts. *Studies in Surface Science and Catalysis*, **120** (2), 723-743.

Full Text: [1999\Stu Sur Sci Cat120, 723.pdf](1999/Stu%20Sur%20Sci%20Cat120,%20723.pdf)

Keywords: Adsorption Tests, Design

? Qiao, S. and Hu, X. (2000), Role of pore size distribution in the binary adsorption kinetics of gases in activated carbon. *Studies in Surface Science and Catalysis*, **128**, 401-410.

Full Text: [2000\Stu Sur Sci Cat128, 401.pdf](2000/Stu%20Sur%20Sci%20Cat128,%20401.pdf)

Abstract: A heterogeneous multicomponent adsorption model is presented to study the adsorption equilibrium and kinetics of mixed gases in activated carbon (AC). The model utilizes a micropore size distribution concept to interpret the solid structural heterogeneity. The pore size is related to the adsorbate-adsorbent interaction energy by the Lennard-Jones potential. The size exclusion effect is taken into account in the competition of different species for a given pore. Both pore diffusion of free species and surface diffusion of adsorbed species are considered in the theory. The driving force for surface diffusion is the chemical potential gradient in the adsorbed phase. Isothermal acid kinetics parameters extracted from single-component data fittings are used to predict multicomponent adsorption kinetics. Single and binary experimental adsorption and desorption data of ethane and propane in Norit activated carbon are collected to validate the model. The agreement between the model results and experimental data is good in general.

Keywords: Energetic Heterogeneity, Model, Micropores, Mixtures

? Berber-Mendoza, S., Leyva-Ramos, R., Mendoza-Barron, J. and Guerrero-Coronado, R.M. (2002), Competitive exchange of lead(II) and cadmium(II) from aqueous solution on clinoptilolite. *Studies in Surface Science and Catalysis*, **142**, 1849-1856.

Full Text: [2002\Stu Sur Sci Cat142, 1849.pdf](2002/Stu%20Sur%20Sci%20Cat142,%201849.pdf)

Abstract: The experimental data for the single exchange isotherms for Pb(II) and Cd(II) were adjusted quite well by the Langmuir isotherm and the exchange capacity for the Pb(II) ion is about 2.3 times that for the Cd(II) ion. The results of the competitive exchange showed that the ion exchange isotherm for Pb(II) was not significantly dependent upon the Cd(II) concentration, this means that Pb(II) ion was exchanged more selectively than the Cd(II) ion. However, the exchange isotherm for Cd(II) was considerably affected by the presence of Pb(II) ions. The exchange capacity for Cd(II) diminished drastically increasing the concentration of Pb(II) ion. Therefore, both ions compete for the same cationic sites of the zeolite but the zeolite is much more selective for the Pb(II) ion than for the Cd(II) ion.

Keywords: Ion-Exchange, Equilibria, Zeolites, Removal, Metals

# Title: Substance Abuse Treatment Prevention and Policy

Full Journal Title: Substance Abuse Treatment Prevention and Policy

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Milligan, K., Niccols, A., Sword, W., Thabane, L., Henderson, J., Smith, A. and Liu, J. (2010), Maternal substance use and integrated treatment programs for women with substance abuse issues and their children: A meta-analysis. *Substance Abuse Treatment Prevention and Policy*, **5**, Article Number: 21.

Full Text: [2010\Sub Abu Tre Pre Pol5, 21.pdf](2010/Sub%20Abu%20Tre%20Pre%20Pol5,%2021.pdf)

Abstract: Background: The rate of women with substance abuse issues is increasing. Women present with a unique constellation of risk factors and presenting needs, which may include specific needs in their role as mothers. Numerous integrated programs (those with substance use treatment and pregnancy, parenting, or child services) have been developed to specifically meet the needs of pregnant and parenting women with substance abuse issues. This synthesis and meta-analysis reviews research in this important and growing area of treatment. Methods: We searched PsycINFO, MEDLINE, PUBMED, Web of Science, EMBASE, Proquest Dissertations, Sociological Abstracts, and CINAHL and compiled a database of 21 studies (2 randomized trials, 9 quasi-experimental studies, 10 cohort studies) of integrated programs published between 1990 and 2007 with outcome data on maternal substance use. Data were summarized and where possible, meta-analyses were performed, using standardized mean differences (d) effect size estimates. Results: In the two studies comparing integrated programs to no treatment, effect sizes for urine toxicology and percent using substances significantly favored integrated programs and ranged from 0.18 to 1.41. Studies examining changes in maternal substance use from beginning to end of treatment were statistically significant and medium sized. More specifically, in the five studies measuring severity of drug and alcohol use, the average effect sizes were 0.64 and 0.40, respectively. In the four cohort studies of days of use, the average effect size was 0.52. of studies comparing integrated to non-integrated programs, four studies assessed urine toxicology and two assessed self-reported abstinence. Overall effect sizes for each measure were not statistically significant (d = -0.09 and 0.22, respectively). Conclusions: Findings suggest that integrated programs are effective in reducing maternal substance use. However, integrated programs were not significantly more effective than non-integrated programs. Policy implications are discussed with specific attention to the need for funding of high quality randomized control trials and improved reporting practices.

Keywords: Alcohol, Alcohol-Use Disorders, Attention, Child, Children, Cohort Studies, Control, Dependent Women, Dissertations, Drug, Drug-Use, Embase, Funding, Maternal, Meta-Analysis, Methods, Mothers, Outcome, Parenting, Policy, Predictors, Pregnancy, Pregnant-Women, Primary-Care, Pubmed, Randomized Clinical-Trial, Research, Risk, Risk Factors, Science, Therapeutic-Community, Treatment, Treatment Outcomes, Urine, Web of Science, Women

# Title: Substance Use & Misuse

Full Journal Title: [Substance Use & Misuse](http://taylorandfrancis.metapress.com/(pq3jdryc04mq3ny2pchuhojk)/app/home/journal.asp?referrer=parent&backto=linkingpublicationresults,1:107866,1), [Substance Use & Misuse](http://weblinks3.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+aphjnh+bt+TD++%222VI%22+A166&_ug=sid+00DFC4AB%2DCF5D%2D4E1C%2D99B7%2D82D725FF35FE%40sessionmgr2+dbs+aph+7352&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%222VI%22+tg%5B0+%2D+db%5B0+%2Daph+op%5B0+%2D+h)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1082-6084

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Nieminen, P. and Isohanni, M. (1997), The use of bibliometric data in evaluating research on therapeutic community for addictions and in psychiatry. *Substance Use & Misuse*, **32** (5), 555-570.

Abstract: The purpose of this study is to describe the publication characteristics associated with therapeutic community research and illustrate differences between addiction studies and other types of therapeutic community papers. A total of 223 published reports on research pertaining to the therapeutic community in a variety of treatment settings from 1987 to 1992 were analyzed. The articles consisted mainly of addiction studies (38%) and hospital psychiatry (36%) studies. Collaborative authorship was scanty. Quantitative studies (systematic data presented and analyzed statistically) were performed more often in addiction papers than in psychiatric therapeutic community papers. Addiction studies were also cited slightly more often. Addictions are often a rather simple and distinct focus for research, as well as a major public health problem. This may lead to the smoother use of traditional quantitative research strategies and standard publication channels than in other psychiatric therapeutic community studies.

Keywords: Therapeutic Community, Substance Misuse, Bibliometrics, Journals, Science

# Title: Suchttherapie

Full Journal Title: Suchttherapie

ISO Abbreviated Title: Suchttherapie

JCR Abbreviated Title: Suchttherapie

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Korkel, J. (2008), Listing of *Suchttherapie* in the Social Science Citation Index Expanded - the Impact Factor as Milestone. *Suchttherapie*, **9** (4), 147.

Keywords: Citation, Impact Factor, Science, Science Citation Index

# Title: Suelo y Planta

Full Journal Title: Suelo y Planta

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1130-796X

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Arrue, J.L. and Lopez, M.V. (1991), Conservation tillage research trends and priorities. *Suelo y Planta*, **1** (4), 555-564.

Abstract: The development and adoption of reduced tillage practices over the last two decades has proven to be an important factor in controlling soil losses in cultivated fields. In order to evaluate the growth pattern of conservation tillage research conducted in the last fifteen years, a bibliometric analysis, based primarily on abstracts published in Soils and Fertilizers, has been performed. The contribution to world output for different geographical regions has been assessed comparing the amount of scientific and technical publications for the 1975-77 and 1987-89 periods. While the output of total tillage related papers has increased only three times in that period, that of conservation tillage papers has increased five times. Though a slight trend to increase the number of papers dealing with soil erosion can be noted, much more attention should be paid to this issue in the Mediterranean region, specially under dryland conditions. A priority research program on new conservation tillage systems for the middle part of the Ebro river valley, NE Spain, is briefly outlined.

# Title: Sugar Journal

Full Journal Title: Sugar Journal

ISO Abbreviated Title:

JCR Abbreviated Title: Sugar J

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Chou, C.C. and Hanson, K.R. (1972), Kinetics of colorants adsorption on carbons. *Sugar Journal*, **35** (3), 8-??.

# Title: Suicide and Life-Threatening Behavior

Full Journal Title: Suicide and Life-Threatening Behavior

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cardinal, C. (2008), Three decades of *Suicide and Life-Threatening Behavior*: A bibliometric study. *Suicide and Life-Threatening Behavior*, **38** (3), 260-273.

Full Text: [2008\Sui Lif-Thr Beh38, 260.pdf](2008/Sui%20Lif-Thr%20Beh38,%20260.pdf)

Abstract: The purpose of this study is to quantify certain characteristics of the articles published in Suicide and Life-Threatening Behavior in three 5-year periods, namely, 1971-1975, 1984-1988, and 1997-2001. The characteristics in question include geographic origin of articles, number of authors per article, number of references listed per article, and number of times an article is cited in the literature. Changes across the three periods in terms of distribution of subjects/participants by age group and gender are also examined. The discussion focuses on explanations for the trends and characteristics that are described.

Keywords: Age, Behavior, Bibliometric, Bibliometric Study, Characteristics, Distribution, Gender, Journals, Literature, Origin, Purpose, Suicide, Trends

# Title: Suo

Full Journal Title: Suo

ISO Abbreviated Title: Suo

JCR Abbreviated Title: Suo

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Surakka, S. and Kamppi, A. (1971), Reduction of BOD and other factors using peat. *Suo*, **??**, 51-57.

Full Text: [S\Suo, 51.pdf](S/Suo,%2051.pdf)

Tummavuori, J. and Aho, M. (1980), On the ion-exchange properties of peat. Part I: On the adsorption of some divalent metal ions (Mn2+, Co2+, Cu2+, Zn2+, Cd2+ and Pb2+) on the peat. *Suo*, **31** (2-3), 45-51.

Full Text: [S\Suo31, 45.pdf](S/Suo31,%2045.pdf)

Aho, M. and Tummavuori, J. (1984), On the ion-exchange properties of peat. Part IV: The effects of experimental conditions on ion exchange properties of sphagnum peat. *Suo*, **35** (2), 47-53.

Full Text: [S\Suo35, 47.pdf](S/Suo35,%2047.pdf)

Selin, P. and Nyrönen, T. (1985), Some applications of the use of peat in waste handling: A review. *Suo*, **36**, 95-100.

Letho, O., Tuhkanen, M., Ishiwatari, R. and Uzaka, M. (1985), Quantitative gas chromatographic analysis of degradation and oxidation products from a Finnish sphagnum peat. *Suo*, **36**, 101-106.

# Title: Suomen Kemistilehti

Full Journal Title: Suomen Kemistilehti

ISO Abbreviated Title:

JCR Abbreviated Title: Suomen Kemist

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Kivalo, P., Lindstro, M. and Sundholm, G. (1971), Chronocoulometric measurement of electrode kinetic parameters and adsorption of cadmium(II) and thallium(I). *Suomen Kemistilehti*, **44** (4), 151-??.

# Title: Superlattices and Microstructures

Full Journal Title: Superlattices and Microstructures

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rashidi, F., Sarabi, R.S., Ghasemi, Z. and Seif, A. (2010), Kinetic, equilibrium and thermodynamic studies for the removal of lead(II) and copper(II) ions from aqueous solutions by nanocrystalline TiO2. *Superlattices and Microstructures*, **48** (6), 577-591.

Full Text: [2010\Sup Mic48, 577.pdf](2010/Sup%20Mic48,%20577.pdf)

Abstract: Titanium dioxide nanocrystallites were synthesized as adsorbents through the hydrolysis of titanium tetrachloride as the precursor in hydrochloric acid The product was analyzed by XRD BET and SEM-EDX analysis indicated that the particles were a mixture of 86 8% rutile and 13 2% anatase TiO2 with spherical shapes The adsorption of Pb (II) and Cu (II) metal ions from aqueous solution onto nano-TiO2 were investigated with variations in pH contact time initial metal ion concentration and temperature The kinetics adsorption isotherm and adsorption thermodynamics of the heavy metals were studied The kinetics data were analyzed by the pseudo-first order pseudo-second order and intraparticle diffusion kinetic models the best correlation coefficients were obtained for the pseudo-second order kinetic model The adsorption results obtained from equilibrium experiments were analyzed by Freundlich Langmuir Temkin and Dubinin-Radushkevich isotherms with the Freundlich Isotherm giving the best fitting isotherm to the equilibrium data The thermodynamic parameters (ΔGº ΔHº and ΔSº) were calculated and it was found that the adsorption process is spontaneous and endothermic and is favored at higher temperature (C) 2010 Elsevier Ltd All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption, Adsorption Isotherm, Adsorption Thermodynamics, Analysis, Aqueous Solution, Aqueous Solutions, Bet, Catalysts, Cd(II), Concentration, Copper, Correlation, Cu, Cu(II), Data, Diffusion, Endothermic, Equilibrium, Experiments, Freundlich, Heavy Metal Ions, Heavy Metals, Hydrolysis, Interface, Intraparticle Diffusion, Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Lead, Low-Temperature, Metal, Metal Ions, Metals, Model, Models, Nano- TiO2, Nanocrystaline TiO2, Particles, Pb, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Rutile, SEM-EDX, Single Metal Solutions, Solution, Solutions, Succinic Anhydride, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamic Studies, Thermodynamics, TiO2, Titanium, Titanium Dioxide, Wastes, XRD

# Title: Supportive Care in Cancer

Full Journal Title: Supportive Care in Cancer

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Weeks, L., Verhoef, M. and Scott, C. (2007), Presenting the alternative: Cancer and complementary and alternative medicine in the Canadian print media. *Supportive Care in Cancer*, **15** (8), 931-938.

Full Text: [2007\Sup Car Can15, 931.pdf](2007/Sup%20Car%20Can15,%20931.pdf)

Abstract: Goals of work Cancer patients repeatedly identify the mass media as a primary information source to support their decisions to use complementary and alternative medicine (CAM). Accordingly, the objectives of this research are to describe: (1) what has been reported in the Canadian print media regarding CAM treatment for cancer between January 1, 1990 and December 31, 2005, (2) how that information was represented, and (3) trends in reporting frequency and reporting characteristics. Materials and methods Content analysis of all articles published in four Canadian newspapers and five magazines that discussed CAM treatment for cancer. Main results 915 articles were identified: 760 newspaper articles and 155 magazine articles. The CAM therapies most commonly described in media reports were: natural health products, CAM therapies in general, special diets, spirituality, and meditation. CAM therapies were most often described in a positive fashion, and CAM use was most often described as a potential cure for cancer. The majority of articles did not present information on the risks, benefits, and costs of CAM use and few provided a recommendation to speak with a health care provider before use. Conclusions The results correspond with the commercial interests of media outlets, as coverage appears to be focused around entertainment rather than information provision. The media play a role in introducing a range of treatment options to cancer patients that may not be discussed by conventional health care providers, however, the information provided in media articles appears insufficient to assist patients with informed decision-making.

Keywords: Alternative, Analysis, Cancer, Care, Characteristics, Complementary, Complementary and Alternative Medicine, Conventional, Costs, Coverage, Decision Making, Decision-Making, General, Health, Health Care, Information, Media, Medicine, Methods, Natural Health Products, Options, Patients, Potential, Primary, Providers, Reporting, Research, Risks, Role, Source, Support, Treatment, Trends, Work

? Vrijmoet-Wiersma, C.M.J., Egeler, R.M., Koopman, H.M., Norberg, A.L. and Grootenhuis, M.A. (2009), Parental stress before, during, and after pediatric stem cell transplantation: A review article. *Supportive Care in Cancer*, **17** (12), 1435-1443.

Full Text: [2009\Sup Car Can17, 1435.pdf](2009/Sup%20Car%20Can17,%201435.pdf)

Abstract: Pediatric stem cell transplantation (SCT) is a stressful treatment for children with relapsed or high-risk malignancies, immune deficiencies and certain blood diseases. Parents of children undergoing SCT can experience ongoing stress related to the SCT period. The aim of this article was to present a literature review of articles on parental distress and adaptation before, during, and after SCT and to identify risk and protective factors. The review was conducted systematically by using PUBMED, Web of Science, PsychInfo, and Picarta databases. Eighteen articles met our inclusion criteria: publishing date between January 1, 1990 and January 1, 2009; studies concerning parents of children undergoing SCT; studies examining the psychological adjustment and/or stress reactions of parents as primary outcomes and studies available in English. Highest levels of parental stress are reported in the period preceding SCT and during the acute phase. Stress levels decrease steadily after discharge in most parents. However, in a subgroup of parents, stress levels still remain elevated post-SCT. Parents most at risk in the longer term display highest levels of stress during the acute phase of the SCT. Psychosocial assessment before SCT, during the acute phase and in the longer term, is necessary to identify parents in need for support and follow-up care.

Keywords: Acute, Adaptation, Adjustment, Assessment, Blood, Bone-Marrow-Transplantation, Childhood-Cancer, Children, Databases, Depressive Symptoms, Distress, Follow-up, Health, Literature, Literature Review, Mothers, Outcomes, Parental Stress, Parents, Pediatric, Pediatric SCT, Predictors, Primary, Psychological, Psychosocial, Publishing, Pubmed, Quality-of-Life, Review, Risk, Science, Stress, The-Literature, Transplantation, Treatment, Web of Science

? Carey, M., Lambert, S., Smits, R., Paul, C., Sanson-Fisher, R. and Clinton-McHarg, T. (2012), The unfulfilled promise: A systematic review of interventions to reduce the unmet supportive care needs of cancer patients. *Supportive Care in Cancer*, **20** (2), 207-219.

Full Text: [2012\Sup Car Can20, 207.pdf](2012/Sup%20Car%20Can20,%20207.pdf)

Abstract: This review aimed to examine (a) trends in the number of publications on unmet needs over time and (b) the effectiveness of interventions designed to reduce unmet needs among cancer patients. An electronic literature search of Medline to explore trends in the number of publications on patients’ unmet needs and an additional literature search of Medline, CINAHL, PsychINFO, and Web of Science databases to identify methodologically rigorous research trials that evaluated interventions to reduce unmet needs were conducted. Publications per year on unmet needs have increased over time, with most being on descriptive research. Nine relevant trials were identified. Six trials reported no intervention effect. Three trials reported that intervention participants had a lower number of unmet needs or lower unmet needs score, compared to control participants. Of these, one study found that the intervention group had fewer supportive care needs and lower mean depression scores; one study found that intervention participants with high problem-solving skills had fewer unmet needs at follow-up; and one study found an effect in favor of the intervention group on psychological need subscale scores. Reasons for varying results across trials and the limited effectiveness of unmet needs interventions are more broadly discussed. These include inadequacies in psychometric rigor, problems with scoring methods, the use of ineffective interventions, and lack of adherence to intervention protocols.

Keywords: Adherence, Breast-Cancer, Cancer, Care, Changing Needs, Control, Databases, Depression, Effectiveness, Follow-Up, Improve, Intervention, Interventions, Literature, Medline, Needs Assessment, Oncology, Patients, Perceived Needs, Psychological, Psychometric Properties, Psychosocial Interventions, Publications, Quality-of-Life, Randomized Controlled-Trial, Research, Review, Rural Women, Science, Survivors, Systematic, Systematic Review, Trends, Unmet Needs, Web of Science, Web-of-Science

# Title: Suranaree Journal of Science and Technology

Full Journal Title: Suranaree Journal of Science and Technology

ISO Abbreviated Title: Suranaree J. Sci. Technol.

JCR Abbreviated Title: Suomen Kemist

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Charuwong, P. and Kiattikomol, R. (2004), Removal of organic compounds from aqueous solution by montmorillonite clays and organo-clays. *Suranaree Journal of Science and Technology*, **11** (??), 39-51.

Full Text: [S\Sur J Sci Tec11, 39.pdf](S/Sur%20J%20Sci%20Tec11,%2039.pdf)

# Title: Surface & Coatings Technology

Full Journal Title: Surface & Coatings Technology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Dubourg, L. and Archambeault, J. (2008), Technological and scientific landscape of laser cladding process in 2007. *Surface & Coatings Technology*, **202** (24), 5863-5869.

Abstract: In the last 30 years, public and private organizations involvement in laser cladding R&D activities is increasing. These activities are mainly conducted in universities, public research institutes and technical centres of private companies worldwide. This study shows a bibliometric analysis of the patents and scientific publications in the laser cladding field for the period ranging from 1985 to 2007. This seeks to identify the activity and trends in its environment for strategic purposes. All the laser cladding processes and all the substrates (steel, aluminium and superalloys) used for coating, repairing and 3D fabrication were taken into account.. At first, the world patent production was analysed in terms of volume (580 patent families found since 1985), frequency and applications. Then, the same strategy was applied to the scientific publications for a total volume of 588 targeted papers. Using bibliometric techniques, an analysis and mapping of the information was performed to highlight the temporal, geographical and institutional aspects of R&D activities. The patented applications were also classified in Order to identify opportunities. This study shows the evolution of the scientific and technological environments of the laser cladding technology and can help public or private organizations to generate new ideas, gain awareness of emerging trends and validate the relevance of projects. Crown Copyright U 2008 Published by Elsevier B.V. All rights reserved.

Keywords: Alloy, Aluminum, Analysis, Applications, Bibliometric, Bibliometric Analysis, Bibliometric Techniques, Bibliometry, Calcium-Phosphate Coatings, Coating, Composite Coatings, Direct Metal-Deposition, Evolution, Fabrication, Field, Journal Paper, Laser Cladding, Mapping, Microstructure, Papers, Parameters, Patent, Patents, Public Research Institutes, Publications, R&D, Relevance, Research, Research Institutes, Scientific Publications, Stainless-Steel, Technology, Temporal, Trends, Universities, Wear

# Title: Surface Complexation Modelling. Hydrous Ferric Oxide

John Wiley & Sons Inc., New York

? Dzombak, D.A. and Morel, F.M.M. (1990), *Surface Complexation Modelling. Hydrous Ferric Oxide*, (Edited by Barnes, D., Forster, C.F. and Hrudey, S.E.), John Wiley & Sons Inc., New York.

# Title: Surface and Interface Analysis

Full Journal Title: [Surface and Interface Analysis](http://www3.interscience.wiley.com/cgi-bin/jtoc/2009/all)

ISO Abbreviated Title: Surf. Interface. Anal.

JCR Abbreviated Title: Surf Interface Anal

ISSN: 0142-2421

Issues/Year: 13

Language: English

Journal Country/Territory: England

Publisher: John Wiley & Sons Ltd

Publisher Address: The Atrium, Southern Gate, Chichester PO19 8SQ, W Sussex, England

Chemistry, Physical: Impact Factor 1.272, 79/113 (2008), Impact Factor 0.998, 90/121 (2009)

Walters, M.J., Pettit, C.M., Bock, F.X., Biss, D.P. and Roy, D. (1999), Capacitance of a metal/liquid interface during anion adsorption: Phase-selective measurement in the presence of D.C. voltage sweep and finite solution resistance. *Surface and Interface Analysis*, **27** (12), 1027-1036.

Full Text: [S\Sur Int Ana27, 1027.pdf](S/Sur%20Int%20Ana27,%201027.pdf)

Abstract: Anion adsorption plays a critical role in pitting corrosion of metals in aqueous media. Frequently, this adsorption occurs as a non-faradaic process, without any electron transfer across the interface. Such processes cannot be studied efficiently by using standard electrochemical methods such as linear sweep voltammetry (LSV), Phase-selective measurement of the interfacial differential capacitance is necessary in such cases. However, when accompanied by LSV, even these latter measurements can be affected severely by the uncompensated solution resistance. In this paper, we describe a relatively simple phase-selective impedance method where both the solution resistance and the differential capacitance can be measured in situ during the d.c. voltage scan of LSV, We apply this technique to study the adsorption properties of ClO4-, Cl- and SCN- on a polycrystalline Au electrode. The results indicate that this method can be standardized easily for the analysis of adsorption isotherms involving similar systems. Copyright (C) 1999 John Whey & Sons, Ltd.

Keywords: Anions, Differential Capacitance, Gold, Impedance, Isotherm, Adsorption, Single-Crystal Surfaces, Double-Layer, 2nd-Harmonic Generation, Electrode, Impedance, Behavior, Cadmium, Drop, Ions

? Payet, V., Dini, T., Brunner, S., Galtayries, A., Frateur, I. and Marcus, P. (2010), Pre-treatment of titanium surfaces by fibronectin: *in situ* adsorption and effect of concentration. *Surface and Interface Analysis*, **42** (6-7), 457-461.

Full Text: [2010\Sur Int Ana42, 457.pdf](2010/Sur%20Int%20Ana42,%20457.pdf)

Abstract: In this work, kinetics data on adsorption of fibronectin (Fn) on passivated Ti surfaces (Ti quartz crystals) in phosphate buffered saline (PBS) solution were obtained from in situ investigations with electrochemical quartz crystal microbalance (EQCM): from experiments performed at 15 and 60 mg l-1 Fn solution concentrations, the maximum adsorption was reached within 30 min, and Fn adsorption seemed to be partially reversible, as about 15% of the initially adsorbed protein were removed upon PBS rinsing. The remaining amount of adsorbed Fn was around 1000 ng cm-2 and was similar for both protein concentrations in solution. Moreover, differences in kinetics were observed between the two concentrations: the initial adsorption rate was much larger at 60 mg l-1 than at 15 mg l-1. Ex situ X-ray photoelectron spectroscopy (XPS) characterizations were used to examine the surface after adsorption under flow (EQCM measurements) or in static conditions: identification of the adsorbed protein and of the passivated TiO2 layer on metallic Ti. With bulk Ti samples, an isotherm of adsorption of Fn in PBS was established on the basis of a selection of Fn solution concentrations and on the maximum time required to get a steady state, for a given concentration. The equivalent thicknesses of adsorbed Fn (d(Fn) (XPS), model of a continuous layer adsorbed on the passivated Ti samples) were estimated by XPS. At saturation, a plateau is reached corresponding to an equivalent thickness of 5.5 nm for Fn solution concentrations larger than 50 mg l-1. Thed(Fn) (XPS) values of the experiments performed under flow are in satisfactory agreement with the values determined from static adsorption experiments. Copyright (C) 2010 John Wiley & Sons, Ltd.

Keywords: Titanium, Fibronectin, Dynamics, Isotherms, XPS, EQCM, Human Plasma Fibronectin, Flow-Cell EQCM, Protein, XPS, Dioxide, Binding, QCM, Ti

? Erdem, B., Özcan, A.S. and Özcan, A. (2010), Preparation of HDTMA-bentonite: Characterization studies and its adsorption behavior toward dibenzofuran. *Surface and Interface Analysis*, **42** (6-7), 1351-1356.

Full Text: [2010\Sur Int Ana42, 1351.pdf](2010/Sur%20Int%20Ana42,%201351.pdf)

Abstract: Bentonite is one of the most commonly used raw materials in the water treatment processes because of its low cost, easily availability and high mechanical and chemical stability. In this study, natural bentonite was modified with a large organic surfactant, which is hexadecyltrimethyl ammonium (HDTMA) bromide. The modified bentonite was called organobentonite. The surface characterization of natural bentonite and HDTMA-bentonite was examined by Fourier transform infrared (FTIR) spectroscopy, X-ray diffractometry(XRD), Brunauer-Emmett-Teller (BET) and thermogravimetric(TG) analysis. FTIRspectroscopy showed the existence of HDTMA functional groups on bentonite surface. XRD results revealed randomly lateral-monolayer arrangements of the intercalated alkylammonium cation. The BET surface area significantly decreased after the modification due to the coverage of the pores of natural bentonite. Differences in the differential thermogravimetric (DTG) peaks for natural-and HDTMA-bentonite were observed and interpreted. HDTMA-bentonite was then tested as an adsorbent for the removal of organic compounds such as dibenzofuran (DBF) from aqueous solutions. The amount of adsorption for HDTMA-bentonite was found to be around 20 times higher than that of natural bentonite in 10 mg dm-3 DBF solution at 20ºC. The adsorption kinetics of DBF onto HDTMA-bentonite was also studied at 20, 30 and 40ºC and thermodynamic parameters were calculated. The overall adsorption process was exothermic and physical in nature. The results indicate that HDTMA-bentonite is an effective and a low-cost adsorbent for the removal of heterocyclic aromatic compounds such as DBF. Copyright (C) 2010 John Wiley & Sons, Ltd.

Keywords: Adsorbent, Adsorption, Adsorption Behavior, Adsorption Kinetics, Ammonium, Analysis, Aqueous Solutions, Aqueous-Solutions, Availability, Behavior, Bentonite, BET, BET Surface Area, Blue, Bromide, Cation, Characterization, Chemical, Cost, Coverage, Dibenzofuran, Dye, Exothermic, Fly-Ash, FTIR, Functional Groups, Kinetics, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Models, Modification, Modified, Natural, Organic, Organic Compounds, Organobentonite, Organoclay, Physical, Preparation, Removal, Si, Solution, Solutions, Spectroscopy, Stability, Surface, Surface Area, Surface Characterization, Surfactant, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Treatment, Water, Water Treatment, X-Ray, XRD

? Mao, Q.H., Zhang, L.P., Huang, D.H., Wang, D., Huang, Y., Xu, H., Cao, H.T. and Mao, Z.P. (2011), Preparation and characterization of flame-retardant lamellar Mg(OH)2 thin films on citric acid-treated cotton fabrics. *Surface and Interface Analysis*, **43** (5), 903-912.

Full Text: [2011\Sur Int Ana43, 903.pdf](2011/Sur%20Int%20Ana43,%20903.pdf)

Abstract: Preparation and characterization of lamellar magnesium hydroxide (Mg(OH)2) thin films on cotton fabrics are reported in this paper. Mercerized cotton fabrics were treated with citric acid, so carboxyl groups were introduced to the surface of the fabrics. Mg(OH)2 seeds were first adsorbed on the citric acid-treated cotton fabrics and then Mg(OH)2 thin films grew on the fabric through secondary growth method. Kinetics and isotherm studies found that the adsorption of Mg(OH)2 seeds on citric acid-treated cotton fabrics followed pseudo second-order kinetic model and Langmuir isotherm. This indicated that Mg(OH)2 seeds adsorption was monolayer chemical adsorption driven by electric attraction between positively charged Mg(OH)2 seeds and -COO- ions on the cotton fiber surface. The X-ray diffraction (XRD) and SEM characterizations of the Mg(OH)2 thin films covered cotton fabrics found that standing flaky Mg(OH)2 crystals formed a shell of porous but continuous network on cotton fabric surface. Owing to the Mg(OH)2 thin film covering, the fabric had fireproof property, lower thermal conductivity and higher optical absorbance in the UV, Vis and IR regions. Copyright (C) 2010 John Wiley & Sons, Ltd.

Keywords: Adsorption, Characterization, Cotton, Dioxide, Flame Retardancy, Growth, Isotherm, Kinetic, Kinetic Model, Kinetics, Lamellar Magnesium Hydroxide, Langmuir, Langmuir Isotherm, Nanoparticles, Nanorods, Pyrolysis, Secondary Growth, Textiles

? Salgin, S. (2011), Effects of ionic environment on the interfacial interactions between alpha-amylase and polyether sulphone membranes. *Surface and Interface Analysis*, **43** (10), 1318-1324.

Full Text: [2011\Sur Int Ana43, 1318.pdf](2011/Sur%20Int%20Ana43,%201318.pdf)

Abstract: This work reports a systematic study on the effects of ionic environment on the adsorption of alpha-amylase on 30 kDa polyether sulphone (PES) membranes on the basis of interfacial interaction of PES membrane and alpha-amylase enzyme in solution. Static adsorption of alpha-amylase was investigated at the solution pH values of pH = 4.5, 5.6 and 7.0; and for the ionic strengths of 0.001, 0.01 and 0.1 M KCl. The maximum adsorption occurred at the pH value below the isoelectric point (IEP) of the enzyme, whereas the minimum adsorption occurred at the IEP (pH = 5.6) of amylase. With increasing ionic strength, the adsorbed enzyme on the membrane decreased. The Freundlich and Langmuir adsorption models were used for the mathematical description of the adsorption equilibrium and isotherm constants were evaluated depending on ionic environment. To determine the steps affecting the adsorption mechanism, the experimental data were evaluated using pseudo-first-order and pseudo-second-order kinetic models. The experimental data fitted well the pseudo-first-order kinetics. To detect the structural changes which occurred, membrane surfaces were analyzed by FTIR-ATR spectroscopy. The effects of ionic environment on amylase activity were also investigated. Copyright (C) 2010 John Wiley & Sons, Ltd.

Keywords: Adsorption, Adsorption Isotherm, Amylase, Biosorption, Bovine Serum-Albumin, Coefficient, Cross-Flow Ultrafiltration, Electrostatic Interaction, Equilibrium, Freundlich, Ionic Environment, Ionic Strength, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Mechanism, Membrane, PES, pH, Protein Adsorption, Pseudo Second Order, Separation, Thermodynamic Parameters

# Title: Surface Review and Letters

Full Journal Title: [Surface Review and Letters](http://weblinks2.epnet.com/HJAFdetail.asp?tb=1&_ug=dbs+3+ln+en%2Dus+sid+E2C30D24%2D31BF%2D4B63%2DAB41%2D4AA55BC9A794%40Sessionmgr2+5090&_uh=btn+N+idb+aphish+jdb+aphjnh+op+phrase+ss+ID++%228KW%22+3F50&_us=sm+ES+E6C7&)

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Subject Categories:

Materials Science Physics, Atomic, Molecular & Chemical Physics, Condensed Matter: Impact Factor

? Ino, S. (1997), Surface structures and surface conductance during metal adsorption on semiconductors. *Surface Review and Letters*, **4** (5), 969-975.

Full Text: Sur Rev Let4, 969.pdf

Abstract: Epitaxial growth modes for ‘two-step deposition’ processes of metals on a Si (111) surface were investigated. Depth distributions of composition during the growth were analyzed by using RHEED-TRAXS (total reflection angle X-ray spectroscopy). We first made (root 3×root 3)-(Ag, Au, Ga), (2 root 3×2 root 3)-Sn and (4×1)-In structures, and then second metals (Ag, Au, Sn, Ga and In) were deposited on these surfaces at room temperature. Growth processes observed are classified into five growth modes: ordinary growth (O), alloying growth (A), substitution atom growth (S), particle formation growth mode (P) and floating atom growth (F). During the growth processes, we measured also surface conductivities which showed interesting behaviors. These results can be partly understood considering the growth modes, atomic arrangement, surface composition, Fermi level pinning and band bending, etc.

? Jiang, H., Imaki, M., Mizuno, S. and Tochihara, H. (1997), (NXn) surface structures formed commonly on Cu (001), Ag (001) and Ni (001) by alkali-metal adsorption, *Surface Review and Letters*, **4** (6), 1227-1232.

Full Text: Sur Rev Let4, 1227.pdf

Abstract: We have studied structures formed on Ag (001) by Na adsorption at 300 K and on Ni (001) by Li deposition at 370 K by means of low energy electron diffraction (LEED). Structure sequences (2×1)--> (3×3)--> (4×4)--> (4×2)--> (2×1) and c (2×2)--> (4×4)--> (5×5) are found with increasing coverages for Na/Ag (001) and Li/Ni (001), respectively. The (3×3) for Na/Ag (001) is determined by tensor LEED analysis to be identical to the previously determined (3×3) structure formed for Li/Cu (001). We suggest that the (4×4) structures for Na/Ag (001) and Li/Ag (001) are also identical to the previously determined (4×4) for Li/Cu (001), and that the (5×5) for Li/Ni (001) is analogous to the (3×3) and (4×4) structures.

Keywords: Energy-Electron Diffraction, Alloy

# Title: Surface Science

Full Journal Title: [Surface Science](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5546&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=815e6784e9e9bbdfeac7589529fef183)

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Language: English

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Publisher Address: PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Chemistry, Physical: Impact Factor 2.198, 23/91 (2000)

Onoda, Jr., G.Y. and De Bruyn, P.L. (1966), Proton adsorption at ferric oxide/aqueous solution interface. I. A kinetic study of adsorption. *Surface Science*, **4** (1), 48-63.

Full Text: [S\Sur Sci4, 48.pdf](S/Sur%20Sci4,%2048.pdf)

Abstract: A kinetic study of the adsorption of potential-determining ions (Hi+) at the ferric oxide (α-Fe2O3)/solution interface is reported. The experimental results obtained by potentiometric titrations of suspensions of the synthetically-prepared solid indicate that a two-step process operates at the interface. The observed results may be explained by a rapid adsroption (or desorption) of protons at the surface of the oxide, followed by the slow diffusion of the adsorbed proton into (or out of) a goethite-like interphase separating the bulk anhydrous oxide from the solution phase. Corroborative evidence for the proposed model and mechanism is supplied.

Scheer, M.D. and McKinley, J.D. (1966), Adsorption kinetics of nitrogen on *Rhenium*. *Surface Science*, **5** (3), 332-344.

Full Text: [S\Sur Sci5, 332.pdf](S/Sur%20Sci5,%20332.pdf)

Abstract: The adsorption of room temperature nitrogen on atomically clean polycrystalline rhenium has been studied. The sticking coefficients at zero coverage were found to be 0.060, 0.009, and 0.007 at rhenium surface temperatures of 205, 300, and 373 °K respectively. These values are between one and two orders of magnitude smaller than those in the nitrogentungsten system. The dependence of the sticking coefficient upon surface coverage and temperature could be accounted for by assuming an intermediate state weakly bound to an adsorption site. These sites were assumed to be uniformly distributed over the surface. Their concentration was found to be less than 1/10 of the number of substrate-rhenium atoms/cm2. The binding energies of the intermediate state and the permanently adsorbed state were in the ratio of about 1: 20 for both the nitrogen-rhenium and nitrogen-tungsten systems. In view of this similarity, it is difficult to account for the large difference in sticking probabilities unless one assumes that tungsten absorbs energy from the intermediate binding state much more efficiently than does the rhenium.

Hoory, S.E. and Prausnit, J.M. (1967), Effect of surface heterogeneity on adsorption isotherm at very low coverage. *Surface Science*, **6** (3), 377-387.

Full Text: [S\Sur Sci6, 377.pdf](S/Sur%20Sci6,%20377.pdf)

Abstract: Two extensions are presented for Ross’ theoretical model of surface heterogeneity. First, consideration is given to the variation of vibrational energy of an adsorbed molecule on different surface patches, each of which is characterized by a particular adsorption potential. Second, consideration is given to the function used for describing the distribution of the adsorption potential. Both extensions are tested on data by Steele and Halsey for adsorption of argon on heterogeneous carbon (black pearls). There does not appear to be any significant advantage in taking into account variations of vibrational energy from patch to patch. Further, the inclusion of negative adsorption potentials in the Gaussian distribution function does not introduce any difficulties, data reduction using the Gaussian distribution is as good as that obtained with the log-normal distribution which includes only positive adsorption potentials.

Bérubé, Y.G., Onoda, Jr., G.Y. and De Bruyn, P.L. (1967), Proton adsorption at ferric oxide/aqueous solution interface. II. Analysis of kinetic data. *Surface Science*, **7** (3), 448-461.

Full Text: [S\Sur Sci7, 448.pdf](S/Sur%20Sci7,%20448.pdf)

Abstract: A quantitative study of the time-dependent abstraction of H+ and OH- ions from solution by crystalline Fe2O3 precipitates is reported. The experimental information was gathered by potentiometric titrations of oxide suspensions, by observation of *p*H drift with time after rapid displacement of the *p*H of the solution initially equilibrated with the solid at the zpc, and by tritium exchange between the tritiated oxide and pure water.

On the assumption that the slow step is controlled by diffusion of protons into or out of a hydrated surface region, an analysis of the *p*H drift experiments yields a diffusion coefficient for protons approximately equal to 10-21 cm2/sec and an activation energy of 20 kcal/*mole*. The tritium exchange experiments confirm the presence of a hydrated surface layer with an estimated thickness not exceeding 26 Å and yield a self-diffusion coefficient of about 10-21 cm2/*sec*. Although both these experimental approaches gave results in support of the proposed phenomenological description of the slow step, the magnitude of the observed abstractions cannot be completely accounted for by proton diffusion into the solid. Comparison with experimental studies on TiO2, ZnO and Al2O3 suggests that the diffusion model proposed by Onoda and de Bruyn1) is to be complemented by a surface anion exchange between OH- and other univalent inorganic anions in order to account for the experimental facts.

Gottwald, B.A. and Haul, R. (1968), Adsorption kinetics. III. Determination of adsorption isotherms from molecular flow experiments. *Surface Science*, **10** (1), 76-90.

Full Text: [S\Sur Sci10, 76.pdf](S/Sur%20Sci10,%2076.pdf)

Abstract: The transient molecular flow of sorbable gases through a capillary has been treated mathematically: Corresponding to the delay of the outflowing process (‘time lag’) the inflow of the gas is also affected by adsorption (‘time lead’). The evaluation of adsorption isotherms from molecular flow experiments is described. Since the whole pressure range below the inlet pressure is covered during a single experiment studies of transient molecular flow are particularly suited for obtaining and characterizing adsorption isotherms at low surface coverages. The influence of the adsorption isotherm on the parameters of the transient flow –– an initial delay and a stretch in time –– is discussed. Conditions are specified, under which an eventual transition of a non-linear (e.g. Dubinin-Radushkevich-) to a Henry-isotherm could become apparent at extremely low surface coverages.

Harris, L.B. (1968), Adsorption on a patchwise heterogeneous surface, mathematical analysis of the step-function approximation to the local isotherm. *Surface Science*, **10** (2), 129-145.

Full Text: [S\Sur Sci10, 129.pdf](S/Sur%20Sci10,%20129.pdf)

Abstract: In order to estimate the energetic heterogeneity of an adsorbent, the theoretically ‘correct’ local isotherm describing adsorption on an individual surface patch is frequently approximated by a step function. The present paper presents a general method with which the errors incurred by using this approximation can be appraised. The differences between the approximate and the exact distribution are calculated for two forms of the latter when the Langmuir local isotherm is assumed to be correct and is approximated by a step function. The differences are discussed and are shown to be directly related to the form of the Langmuir isotherm.

Misra, D.N. (1969), Adsorption on heterogeneous surfaces: A Dubinin-Radushkevich equation. *Surface Science*, **18** (2), 367-372.

Full Text: [S\Sur Sci18, 367.pdf](S/Sur%20Sci18,%20367.pdf)

Abstract: A site energy distribution function for a ‘generalized form’ of the Dubinin-Radushkevich equation has been obtained by the Stieltjes transform method of Sips. The distribution function is identical in form to the one empirically obtained by Hobson and Armstrong on the basis of the potential theory of adsorption. The Langmuir adsorption isotherm is presumed to be valid for the individual ‘homotattic’ sites and, therefore, the generalized Dubinin-Radushkevich equation and hence the distribution function are only valid within the domain of conditions imposed on the Langmuir isotherm.

Knözinger, H. and Jeziorowski, H. (1970), Adsorption behavior of thorium xoide. I. Kinetics of adsorption of ethanol, ethylether and water. *Surface Science*, **22** (1), 111-124.

Full Text: [S\Sur Sci22, 111.pdf](S/Sur%20Sci22,%20111.pdf)

Abstract: From adsorption kinetics the intraparticle diffusion coefficients for water, diethyl ether and ethanol have been calculated for a microporous thorium oxide sample to be of the order of 10−13–10−14 cm2/sec in the temperature range between 100 and 200°C at 80 Torr. It can be shown that the mass transport proceeds in the adsorbed phase only, most probably by hydrodynamic flow of an adsorbed liquid film.

Knözinger, H. and Jeziorowski, H. (1970), Das adsorptionsverhalten von thoriumoxid I. Kinetik der adsorption Von Äthanol, Äthyläther und Wasser. *Surface Science*, **22** (1), 111-124.

Full Text: [S\Sur Sci22, 111.pdf](S/Sur%20Sci22,%20111.pdf)

Abstract: From adsorption kinetics the intraparticle diffusion coefficients for water, diethyl ether and ethanol have been calculated for a microporous thorium oxide sample to be of the order of 10-13–10-14 cm2/sec in the temperature range between 100 and 200°C at 80 Torr. It can be shown that the mass transport proceeds in the adsorbed phase only, most probably by hydrodynamic flow of an adsorbed liquid film.

Gasser, R.P.H., Szczepur, A.K., Overton, J.M. and Morton, T.N. (1971), Kinetic isotope-effect in hydrogen adsorption on tungsten. *Surface Science*, **28** (2), 574-580.

Full Text: [S\Sur Sci28, 574.pdf](S/Sur%20Sci28,%20574.pdf)

Abstract: A kinetic isotope effect in the rate of adsorption of hydrogen on polycrystalline tungsten has been sought, following the report of such an effect on a (100)-oriented tungsten crystal. However, no difference between the isotopes could be detected. The reason for these discordant results may lie either in an unidentified experimental artefact or in a genuine difference between oriented and polycrystalline surfaces.

King, D.A. and Wells, M.G. (1972), Molecular beam investigation of adsorption kinetics on bulk metal targets: Nitrogen on tungste. *Surface Science*, **29** (2), 454-482.

Full Text: [S\Sur Sci29, 454.pdf](S/Sur%20Sci29,%20454.pdf)

Abstract: An ultra high vacuum molecular beam technique for the study of the kinetics of the interaction of reactive gases with well-defined metal surfaces is described. Well collimated beams of nitrogen molecules, with an accurately measured intensity of 1012 to 1013 molecules cm-2 sec-1 over a target area of ~ 4×10-2 cm2, are obtained using a series of five chambers differentially pumped with a combination of high speed diffusion pumps and strategically deposited titanium getter films. Out-of-beam leakage into the adsorption cell was < 108 molecules sec-1. A method is described for obtaining absolute values of sticking probabilities and surface coverages with a high degree of accuracy.

For nitrogen on a polycrystalline tungsten foil, sticking probabilities and their coverage profiles were found to be independent of incident molecular beam angle, over a range of 60°, with an initial sticking probability, *s*0, at 300 K of 0.61±0.02. The sticking probability profile is monotonie over the range examined, and is theoretically described in terms of a modified form of Kisliuk’s precursor state model, with self-consistent parameters. On a linear plot, the sticking probability extrapolates to zero at a coverage of 3.0(±0.5)×1014 molecules cm2. On the W(111) plane *s*0 was found to be 0.08±0.01, and the sticking probability falls linearly with increasing coverage, with a saturation coverage of 1.2(±0.2)×1014 molecules cm-2. It is argued that adsorption sites on the (111) plane are created by the presence of surface vacancies or randomly distributed W atoms on the perfect (111) surface. Within the limits of detection of the molecular beam technique no nitrogen adsorption could be detected on the (110) plane of tungsten, in agreement with previous work.

López-Sancho, J.M. and De Segovia, J.L. (1972), Adsorption kinetics and electron desorption of O2 on polycrystalline tungsten. *Surface Science*, **30** (2), 419-439.

Full Text: [S\Sur Sci30, 419.pdf](S/Sur%20Sci30,%20419.pdf)

Abstract: Electron desorption parameters and sticking coefficients of O2 adsorbed on polycristalline tungsten have been studied. Two clearly-distinct adsorption states, β1 and β2, are identified with desorption energies of 110 kcal/mol and 96 kcal/mol, the desorption temperatures are 2150 and 1900°K respectively. Desorption from β1 yields atomic oxygen and from β2 a complex WOn. The populations are *n*β1 = 8.7×1014 molecules/cm2 and *n*β2 = 2×1014 molecules/cm2 at 77 °K. The sticking coefficients, as a function of coverage for both states, have been determined (*s*0β1 ≅ 1, *s*0β2 = 0.8 *at* 77 °K and *s*0β1 = 0.98, *s*0v2 = 0.76 at 300 °K), being the experimental points fitted by a theoretical expression. From the values of so, (*E*A - *E*P) for both states has been calculated, *E*A being the activation energy of chemisorption and *E*P the depth of the potential well in the preadsorbed state.

Procop, M. and Völter, J. (1972), Adsorption of hydrogen on platinum. I. Adsorbed amounts, kinetics of adsorption and desorption. *Surface Science*, **33** (1), 69-81.

Full Text: [S\Sur Sci33, 69.pdf](S/Sur%20Sci33,%2069.pdf)

Abstract: Chemisorption of hydrogen on a platinum-foil has been studied by the flash-filament technique and by the capillary-flow method. Isobars were determined at temperatures between 140 and 600° K and at pressures between 10−4 and 10−6 torr. The dependence of the isosteric heat of adsorption *E* on the coverage σ is given by *E* = 16.3 − 1.4×10−14σ (kcal/mole) with σ<2.5×1014 molecules/cm2. At higher coverages *E* reaches values smaller than 5 kcal/mole. Adsorption and desorption at low coverages are second order processes. The initial sticking probability is 4.5×10−3. The results are discussed in terms of an atomic and a molecular state of the adsorbed hydrogen.

Procop, M. and Völter, J. (1972), Adsorption von Wasserstoff an platin I. Adsorbierte menge, kinetik der ad- und desorption. *Surface Science*, **33** (1), 69-81.

Full Text: [S\Sur Sci33, 69.pdf](S/Sur%20Sci33,%2069.pdf)

Abstract: Chemisorption of hydrogen on a platinum-foil has been studied by the flash-filament technique and by the capillary-flow method. Isobars were determined at temperatures between 140 and 600° K and at pressures between 10-4 and 10-6 torr. The dependence of the isosteric heat of adsorption *E* on the coverage σ is given by *E* =16.3 -1.4×10-14 σ (kcal/mole) with σ < 2.5×1014 molecules/cm2. At higher coverages *E* reaches values smaller than 5 kcal/mole. Adsorption and desorption at low coverages are second order processes. The initial sticking probability is 4.5×10-3. The results are discussed in terms of an atomic and a molecular state of the adsorbed hydrogen.

Appel, J. (1973), Freundlich’s adsorption isotherm. *Surface Science*, **39** (1), 237-244.

Full Text: [S\Sur Sci39, 237.pdf](S/Sur%20Sci39,%20237.pdf)

Abstract: We present a brief derivation of Freundlich’s adsorption isotherm using straightforeward methods of statistical mechanics. The assumption that the adsorbed atoms move in Morse potential wells of different depths leads to the observed compensation effect in the energy dependence of the occupation probability of surface sites, essential for the understanding of Halsey’s form of the Freundlich isotherm.

Henzler, M. and Töpler, J. (1973), Adsorption of water-vapor on clean cleaved germanium. I. Structural and kinetic-properties. *Surface Science*, **40** (2), 388-396.

Full Text: [S\Sur Sci40, 388.pdf](S/Sur%20Sci40,%20388.pdf)

Abstract: Germanium (111) faces cleaved in UHV have been exposed to water vapor in the pressure range 10-8 to 1 torr. From LEED observations and Auger electron spectroscopy an adsorption up to one monolayer with two sites per molecule is derived. After adsorption each molecule precludes 3–4 surface atoms from further adsorption. From the disappearance of the superstructure of the clean surface with a fraction of a monolayer it is concluded that each adsorbed molecule converts a patch with about 50–80 surface atoms with respect to superstructure.

King, D.A. (1975), Thermal desorption from metal surfaces: A review. *Surface Science*, **47** (1), 384-402.

Full Text: [S\Sur Sci47, 384.pdf](S/Sur%20Sci47,%20384.pdf)

Abstract: In this review an attempt is made to draw correlations between thermal desorption and structural studies of chemisorption on metal surfaces. Alternative models are discussed for the appearance of multiple peaks and for lineshape analysis in desorption, the first involving multiple binding states and the second lateral interactions within a homogeneous chemisorbed layer. Criteria are discussed for distinguishing between the various possibilities for a particular system, in particular with relation to the adsorption of hydrogen and carbon monoxide on tungsten.

Beck, D.E. and Miyazaki, E. (1975), Molecular adsorption: Analysis of kinetics of adsorption experiment at constant pressure with bulk diffusion. *Surface Science*, **48** (2), 473-485.

Full Text: [S\Sur Sci48, 473.pdf](S/Sur%20Sci48,%20473.pdf)

Abstract: A theoretical analysis of the irreversible adsorption and dissociation of a diatomic gas on the surface of a solid, and the diffusion of the atoms into the substrate is presented. The surface and bulk are treated as separate entities in this analysis. The boundary conditions chosen for the solution of the coupled differential equations are those which correspond to the physical conditions in a ‘dynamic’ adsorption experiment. In analyzing the experimental data for the adsorption of oxygen and nitrogen on titanium, we find that it is nor necessary to invoke diffusion through a compact scale to understand the experimental results.

Baikerikar, K.G. and Hansen, R.S. (1975), Electrocapillary study to test applicability of Flory-Huggins isotherm. *Surface Science*, **50** (2), 527-540.

Full Text: [S\Sur Sci50, 527.pdf](S/Sur%20Sci50,%20527.pdf)

Abstract: The Flory-Huggins isotherm with interaction parameter has been tested using accurate electrocapillary data for four aliphatic compounds at the mercury-electrolytic solution interface. When surface coverages derived by differentiation of surface pressure-activity data were tested in the Flory-Huggins isotherm and when all parameters were freely optimized, the equation fit the data very well in all cases, but the size ratio parameter thus obtained was about 0.5. When parameters of the Flory-Huggins isotherm were fixed by limiting properties of surface pressure-activity data directly (with no differentiations performed), the size parameter was about 1.0. The size parameter expected physically is about 3.0. The Flory-Huggins isotherm with realistic size parameters did not fit the data as well as the simpler Frumkin equation in any of the cases considered. The physical basis underlying both models is weak for interaction parameters as large as encountered in aqueous-organic solute systems.

Jaroniec, M. (1975), Adsorption on heterogeneous surfaces - exponential equation for overall adsorption-isotherm. *Surface Science*, **50** (2), 553-564.

Full Text: [S\Sur Sci50, 553.pdf](S/Sur%20Sci50,%20553.pdf)

Abstract: The adsorption isotherm for heterogeneous surfaces can be very well approximated by the exponential higher degree polynomial of variable In (*p*/*p*0). This equation is obtainable by statistical thermodynamics methods. On some simplifying assumptions one can obtain the Dubinin-Radushkevich and Freundlich adsorption isotherms from the exponential isotherm. The energy distribution function corresponding to the exponential adsorption isotherm can be calculated in the way analogous to that for DR isoterm.

Steinbrüchel, C.O. (1975), On the interpretation of adsorption and desorption kinetics experiments. *Surface Science*, **51** (2), 539-545.

Full Text: [S\Sur Sci51, 539.pdf](S/Sur%20Sci51,%20539.pdf)

Jaroniec, M. and Rudziński, W. (1975), Adsorption of gas mixtures on heterogeneous surfaces: The integral representation for a monolayer total adsorption isotherm. *Surface Science*, **52** (3), 641-652.

Full Text: [S\Sur Sci52, 641.pdf](S/Sur%20Sci52,%20641.pdf)

Abstract: The authors extended the integral equation for a one-component adsorption isotherm on to *n*-component adsorption from gaseous mixtures. It appears that the *n*-component adsorption isotherm on heterogeneous surfaces can be presented as a multiple integral. Two methods were used for evaluation of the surface heterogeneity with regard to a gas mixture. The first method is based on the *n*-dimensional gaussian energy distribution. The second one concerns the extension of our method for studying adsorption systems of high surface heterogeneity. Two-component adsorption systems have been analyzed in details.

Bienfait, M. and Venables, J.A. (1977), Kinetics of adsorption and desorption using Auger electron spectroscopy: Application to xenon covered (0001) graphite. *Surface Science*, **64** (2), 425-436.

Full Text: [S\Sur Sci64, 425.pdf](S/Sur%20Sci64,%20425.pdf)

Abstract: Three regimes of condensation have been observed between 74 and 80 K in the adsorption and desorption of a submonolayer film of xenon. The first one corresponds to thej condensation or evaporation of a two-dimensional (2D) ‘gas’, the second one to the growth of 2D crystal in the presence of the 2D gas, and the third one to the completion of the 2D crystal on the (0001) graphite face. Zero order kinetics for both adsorption and desorption is found in the large range of coverage (0.3 < θ <0.9) where the two phases coexist on the surface. The activation energy of desorption of the 2D crystal is measured, its value (~6 kcal mole-1) is in fair agreement with the value of the latent heat of evaporation of this phase (5.5 or 5.7 kcal mole-1) determined previously. No activation energy of nucleation has been observed during the adsorption process. The growth rate is controlled by the incident flux only.

Jones, R.G. and Perry, D.L. (1978), The chemisorption of mercury on tungsten (100): Adsorption and desorption kinetics, equilibrium properties and surface structure. *Surface Science*, **71** (1), 59-74.

Full Text: [S\Sur Sci71, 59.pdf](S/Sur%20Sci71,%2059.pdf)

Abstract: The adsorption of mercury on W(100) has been studied by Auger spectroscopy, LEED and by work function and thermal desorption measurements. Mercury adsorbs at room temperature to form a (1×1) monolayer, with a sticking probability of unity and a heat of adsorption of 208±12kJ mol-1. The coverage dependence of the work function change is interpreted according to an island growth mechanism which is shown to be consistent with the LEED observations. At higher temperatures, the equilibrium isotherms show evidence for attractive adsorbate-adsorbate lateral interactions. The isotherms were simulated using a localised adlayer model within the quasi-chemical approximation. This gave a nearest-neighbour pairwise interaction energy of 5.85 kJ mol-1. The attractive interactions are shown to be consistent with the mechanism invoked to explain the desorption kinetics, which are zero order.

? Taylor, J.L., Ibbotson, D.E., and Weinberg, W.H. (1979), The chemisorption of oxygen on the (110) surface of iridium. *Surface Science*, **79** (2), 349-384.

Full Text: [1960-80\Sur Sci79, 349.pdf](1960-80/Sur%20Sci79,%20349.pdf)

Abstract: The chemisorption of oxygen on Ir(110) has been investigated under ultra-high vacuum conditions with thermal desorption mass spectrometry, contact potential difference measurements, Auger electron spectroscopy, and LEED. Oxygen may adsorb in three distinct chemical states: a molecularly chemisorbed species that is stable below 100 K, a dissociatively chemisorbed species, and a surface oxide that forms rapidly above 700 K. The oxide layer saturates at a coverage of 0.25 ML (1 *ML* = 9.6×1014*atoms*/*cm*2) and orders to form a (1×4) LEED pattern. Different LEED patterns of dissociatively chemisorbed oxygen are observed on clean and oxidized Ir(110). A p(2×2) pattern forms on the clean surface near 0.25 ML coverage whereas a c(2×2) pattern forms on the oxidized surface near 0.5 ML coverage. Oxygen desorbs molecularly from Ir(110) with an activation energy of 45–70 kcal/mole, decreasing continuously with increasing coverage. The adsorption kinetics are described by a second-order precursor model for surface temperatures between 300–700 K. Oxygen chemisorption is not activated since the initial sticking probabilities on the clean and the oxidized Ir(110) surfaces are equal to 0.28 and 0.4, irrespective of the surface temperature. The dipole moment and polarizability of dissociatively chemisorbed oxygen change at 0.25 ML coverage on the clean surface and at 0.5 ML coverage on the oxidized surface. Although the dipole moment for any coverage is independent of temperature, the polarizability is inversely proportional to temperature. The activation energy for the dissociation of molecularly chemisorbed oxygen is 8 kcal/mole.

Vlad, M. and Segal, E. (1979), A Kinetic analysis of Langmuir model for adsorption within the framework of Jovanovic theory: A generalization of the Jovanovic isotherm. *Surface Science*, **79** (2), 608-616.

Full Text: [S\Sur Sci79, 608.pdf](S/Sur%20Sci79,%20608.pdf)

Abstract: This paper presents a comparative kinetic analysis of the Langmuir and Jovanovic models for adsorption of gases on solid surfaces. Taking into account of the settling times distribution of the adsorbed molecules on the surface, the authors suggest a generalization of the Jovanovic isotherm.

Paunov, M. and Michailov, E. (1979), Mass-spectrometry of condensation of thin-layers on unlike substrates. I. Kinetics of adsorption and desorption of Ag on tungsten. *Surface Science*, **81** (2), 479-490.

Full Text: [S\Sur Sci81, 479.pdf](S/Sur%20Sci81,%20479.pdf)

Abstract: The adsorption and desorption kinetics of silver on clean polycrystalline tungsten were investigated with a mass-spectrometric technique. The deposition up to about 2 monolayers occurred without two-dimensional phase transformation. The thermal accommodation coefficient was found to be unity. The desorption energy and frequency factor for different coverages were determined. The bonding of silver atoms in the first monolayer was found to be localized. Additionally, thermal desorption experiments with linear heating rate were carried out.

Paunov, M. and Michailov, E. (1979), Massenspektrometrische untersuchungen der kondensation von dünnen schichten auf fremden unterlagen I. Kinetik der adsorption und der desorption von Ag auf W. *Surface Science*, **81** (2), 479-490.

Full Text: [S\Sur Sci81, 479.pdf](S/Sur%20Sci81,%20479.pdf)

Abstract: The adsorption and desorption kinetics of silver on clean polycrystalline tungsten were investigated with a mass-spectrometric technique. The deposition up to about 2 monolayers occurred without two-dimensional phase transformation. The thermal accommodation coefficient was found to be unity. The desorption energy and frequency factor for different coverages were determined. The bonding of silver atoms in the first monolayer was found to be localized. Additionally, thermal desorption experiments with linear heating rate were carried out.

Schönhammer, K. (1979), On the Kisliuk model for adsorption and desorption kinetics. *Surface Science*, **83** (2), L633-L636.

Full Text: [S\Sur Sci83, L633.pdf](S/Sur%20Sci83,%20L633.pdf)

? Schwarz, J.A. and Kelemen, S.R. (1979), Adsorption-desorption kinetics of CO from clean and sulfur covered Ru(001). *Surface Science*, **87** (2), 510-524.

Full Text: [1960-80\Sur Sci87, 510.pdf](1960-80/Sur%20Sci87,%20510.pdf)

Abstract: The total uptake of CO, its adsorption kinetics and its desorption kinetics from clean and partially sulfur covered surfaces of the basal plane of ruthenium have been investigated. The method of desorption rate isotherms applied to the CO flash desorption spectra from these surfaces was used to evaluate the coverage dependence of the binding energy of CO as well as the effect of various levels of sulfur on this binding energy. Below a total surface concentration of 1 adsorbate atom per 3 surface Ru atoms, the binding energy and sticking probability of CO on the clean and sulfur covered surfaces are the same. Above this concentration of total adsorbates, the adsorption kinetics is the same on all surfaces studied, the binding energy decreases linearly with CO coverage while the magnitude of the decrease increases with sulfur coverage. The total uptake of CO depends on the amount of preadsorbed sulfur. At low coverages of sulfur, total CO uptake is effected by the excluded volume of sulfur. At higher coverages of sulfur (approaching 1/2 the maximum sulfur concentration on the clean surface) the site requirements of sulfur limits the amount of CO that can adsorb on the remaining surface, to the quantity of 1 adsorbate atom per 2 Ru atoms.

? Schwarz, J.A. (1979), Adsorption-desorption kinetics of H2 from clean and sulfur covered Ru(001). *Surface Science*, **87** (2), 525-538.

Full Text: [1960-80\Sur Sci87, 525.pdf](1960-80/Sur%20Sci87,%20525.pdf)

Abstract: The adsorption and desorption kinetics of hydrogen from clean and partially sulflded surfaces of the (001) face of ruthenium were studied. Adsorption is dissociative and can be described by (1 − θ)2 kinetics. Desorption rate isothermal analysis of flash desorption spectra of hydrogen from the clean surface show that the desorption energy for hydrogen decreases linearly with increasing H2 coverage. The low coverage value of the desorption energy is 26 kcal/mole, decreasing to ≈11 kcal/mole at a coverage θH ≈ 0.8. The pre-exponential factor varies in sympathy with the desorption energy and thus the apparent second-order rate constant demonstrates a compensation effect. No hydrogen could adsorb on the first ordered overlayer of sulfur—the Ru(001)−(2×2)S. The LEED pattern was preserved which indicated that hydrogen does not displace sulfur from this surface. The effect of increasing amounts of sulfur on hydrogen adsorption is to rapidly suppress the saturation amount of hydrogen that can be adsorbed, sulfur acts to block dissociation sites for hydrogen adsorption and recombination sites for hydrogen desorption. The desorption rate parameters for hydrogen at fixed hydrogen coverage and increasing sulfur coverage decreases. The decrease parallels the decrease found for the clean surface with increasing hydrogen coverage.

? Behm, R.J., Christmann, K. and Ertl, G. (1980), Adsorption of hydrogen on Pd(100). *Surface Science*, **99** (2), 320-340.

Full Text: [1960-80\Sur Sci99, 320.pdf](1960-80/Sur%20Sci99,%20320.pdf)

Abstract: The energetic, kinetic and structural properties of hydrogen chemisorbed on a Pd(100) surface were studied by means of thermal desorption, work function and LEED measurements. Under the applied conditions no interference with bulk dissolution occurs and dissociative adsorption gives rise to a continuous increase of the work function by up to 0.20 eV. The dipole moment of the adsorbate complex is constant up to θ ≈ 0.9 and then increases until saturation at θ ≈ 1.35 (at 170 K) is reached. The formation of a second adsorbed state at high coverages manifests itself also by a low-temperature shoulder in the thermal desorption spectra and in the variation of the isosteric heat of adsorption, Ead, with coverage: Ead remains practically constant (24.5kcal/mole) up to θ ≈ 0.9 and then decreases. The sticking coefficient is initially rather high (s0 ≈ 0.5) and varies with coverage in a way which can be described by a precursor-state model. The preexponential factor for desorption is about 10−2 cm2 atom−1 s−1. Desorption follows second order kinetics only at very low coverages, at high θ it exhibits quasifirst order. This effect is attributed to the existence of lateral interactions between adsorbed hydrogen atoms which manifest themselves also in the appearance of a c(2×2) LEED pattern at low temperatures. The ‘extra’ diffraction spots attain their maximum intensity at θ = 0.5, and a structural model is proposed whereafter in this phase the H atoms occupy next-nearest neighboring adsorption sites with local fourfold symmetry. Order-disorder transitions were followed by recording the intensity of the half-order spots as a function of temperature at various coverages. The resulting phase diagram exhibits a critical temperature Tc = 260 K at θ = 0.5 and is slightly asymmetric with respect to this coverage. The data are analysed in terms of a lattice gas model and estimates for the pairwise interaction energies yield repulsion between nearest neighbors (w1 = 0.5 kcal/mole) and attraction between next-nearest neighbors (w2 = −0.3 kcal/mole). The additional operation of non-pair-wise interactions is made responsible for the asymmetric shape of the phase diagram. Whereas the adsorbed layer is obviously localized at T ≥ 270 K, a detailed analysis of the adsorption entropy reveals that for T ≥ 370 K a rather good description can be obtained with a model of delocalized two-dimensional translation.

Grüning, H. and Heiland, G. (1982), Binding and decomposition of organic-dye molecules on ZnO crystals. *Surface Science*, **122** (3), 569-587.

Full Text: [S\Sur Sci122, 569.pdf](S/Sur%20Sci122,%20569.pdf)

Abstract: Prism surfaces of ZnO crystals are prepared by various pretreatments as heating in ultrahigh vacuum (UHV), annealing in oxygen at pressures up to 105 Pa, argon bombardment, cleavage in UHV. An organic dye is deposited by sublimation in UHV and the exposure (1012−1015 cm−2 is recorded by means of a vibrating quartz. Adsorption and desorption studies including thermal desorption spectroscopy (TDS) are performed with variation of crystal temperature during deposition and of coverage. In these experiments the spectral distribution of absorption is used for the recording of coverage down to about 1012 cm−2, for the observation of ordering processes within the dye layer and for the detection of dye decomposition. By the various treatments the catalytic activity of the ZnO surface for decomposition of the dye molecules at temperatures above 350 K can be increased or decreased in a wide range. Possible sources of the activity are discussed. Molecules bound to a clean inactive ZnO surface desorb above 600 K. In contrast they come off already at 350 K if they are bound only to other molecules. A sticking coefficient is derived as a function of coverage at 470 K and compared with calculations after several adsorption models. The best fit is obtained by a precursor state model.

? Kołaczkiewicz, J. and Bauer, E. (1985), Clausius-Clapeyron equation analysis of two-dimensional vaporization. *Surface Science*, **155** (2-3), 700-714.

Full Text: [1985\Sur Sci155, 700.pdf](1985/Sur%20Sci155,%20700.pdf)

Abstract: The temperature dependence of the work function change caused by adsorption of Cu, Ag, Au, Ni and Pd on W(110) and of Ag and Au on W(211) is analyzed with the aid of the Clausius-Clapeyron equation. It is found that the heat of two-dimensional evaporation has a high and a low temperature value which indicates evaporation from smooth island edges at low temperature and rough edges at high temperature. A two-dimensional roughening transition is implied.

Daitzchman, C., Aharoni, C. and Ungarish, M. (1991), Effect of subsurface penetration on the kinetics of chemisorption. *Surface Science*, **244** (3), 362-370.

Full Text: [S\Sur Sci244, 362.pdf](S/Sur%20Sci244,%20362.pdf)

Abstract: Expressions describing the kinetics of chemisorption of gases by metallic surfaces are derived, assuming that the sorbate penetrates into a narrow subsurface selvedge adjacent to the surface. It is also assumed that in the selvedge, the energy of sorption decreases with depth and the transport of the sorbate is governed by diffusional laws. The model leads to plots of the sticking coefficient against the quantity adsorbed, in which the sticking coefficient is high and constant at low coverage but drops sharply at some higher coverage with a slope that decreases gradually. The initial part corresponds to a range in which the kinetics are determined by the rate of arrival of the sorbate from the gas phase to the solid phase, and the final part to a range in which the diffusional process is rate determining. The process may appear to be non-activated even when diffusion is activated. The coverage at which the sharp decrease of the sticking coefficient occurs is small when the pressure is high, when the selvedge is deep or indistinguishable from the bulk and when diffusion is slow.

Keywords: Adsorption, Nitrogen, Single-Crystal, Surfaces

Ertl, G. (1994), Reactions at well-defined surfaces. *Surface Science*, **299-300**, 742-754.

Full Text: [S\Sur Sci299, 742.pdf](S/Sur%20Sci299,%20742.pdf)

Abstract: Early work (mainly by Langmuir) has erected the conceptual framework for chemical reactions occurring at well-defined solid surfaces and forming the basis for heterogeneous catalysis but experimental verification has been enabled only during the past three decades. My first contribution to Surface Science appeared in 1967 and concerned the interactions of various molecules with Cu single-crystal surfaces, mainly by using LEED. This technique revealed not only structural information, but also was applicable for studying kinetic phenomena as exemplified somewhat later with the catalytic oxidation of carbon monoxide on Pd(110). Some of the questions raised in this early work could be answered only quite recently or were revealed to be even more complex than anticipated. This holds in particular for catalytic reactions under steady-state conditions for which a wealth of phenomena of nonlinear dynamics, ranging from oscillatory or chaotic kinetics to spatio-temporal pattern formation, may occur.

? Tomellini, M. (1994), The initial uptake rate in precursor mediated adsorption. *Surface Science*, **303** (1-2), L354-L360.

Full Text: [1994\Sur Sci303, L354.pdf](1994/Sur%20Sci303,%20L354.pdf)

Abstract: In the light of a kinetic model for precursor mediated adsorption, the steady state approximation for the transient surface coverage has been investigated. The expression for the experimental value of the initial uptake rate, derived by kinetics, is obtained in terms of the rate constants introduced in the model. The well-known formula for the initial sticking coefficient usually adopted for precursor mediated adsorption is found to be a limiting case of the general one. The constraints that allow for that expression to be valid have been established and discussed.

It is shown that under certain experimental conditions the initial uptake rate, as derived from adsorption data, could be representative of the molecule trapping coefficient into the precursor state. The trapping coefficient has also been described by means of a thermodynamic model and indicates that its temperature dependence is mainly dictated by the temperature dependence of the standard entropy change of adsorption.

Keywords Plus: Metal-Surfaces, Desorption, Kinetics, Pt(111), H2, Co

Cordatos, H., Bunluesin, T. and Gorte, R.J. (1995), Study of CO, NO, and H2 adsorption on model Pd/alpha-Al2O3(0001) catalysts. *Surface Science*, **323** (3), 219-227.

Full Text: [S\Sur Sci323, 219.pdf](S/Sur%20Sci323,%20219.pdf)

Abstract: We have examined the adsorption of CO, NO, and H2 on alpha-Al2O3(0001)-supported, Pd particles using temperature-programmed desorption (TPD) in order to determine the effect of particle size on the desorption rates. For vapor deposition of Pd at 295 K, one obtains layer-by-layer growth of the Pd film. The film coalesces into a relatively uniform distribution of particles above similar to 600 K, as shown by TEM, with the particle sizes depending on the metal coverage. TPD curves for CO from all particle sizes are very similar to curves reported for bulk metals, with a main desorption feature at similar to 490 K and a second peak at similar to 375 K, however, the relative amount of CO desorbing from the low-temperature feature, assigned to linear CO, increases significantly for very small particles (similar to 1.6 nm). For NO, more than half of the molecules desorb intact from large particles (> 5 nm), with the remainder forming N2O and N2 at similar to 550 K and leaving adsorbed oxygen. The fraction of molecules which dissociate during TPD increases significantly for small particles and only N-2 is observed as a product above 600 K. For H2 at 120 K, desorption occurs in two regions on large particles, between 250 and 400 K for surface hydrogen and at similar to 180 K for hydrogen from the bulk. The only significant difference on small particles is the absence of the 180 K state. These results are discussed in terms of their implications for Pd particle-size effects in catalysis.

Keywords: Temperature-Programmed Desorption, Palladium Particles, Supported Palladium, Carbon-Monoxide, Alpha-Al2O3(0001), Chemisorption, Oxide, Size, Overlayers, Oxidation

Karpov, S.Y. and Maiorov, M.A. (1996), Analysis of V-group molecules sticking to III-V compound surfaces. *Surface Science*, **344** (1-2), 11-22.

Full Text: [S\Sur Sci344, 11.pdf](S/Sur%20Sci344,%2011.pdf)

Abstract: Previous experiments carried out with the reflection mass spectrometry [12-15] are used to choose an adequate physical model of V-group molecules interaction with III-V-compound surfaces from the set of the possible ones. Comparison to the experimental data shows that a physisorption state plays an important role in the As-4 molecule adsorption on GaAs, AlAs, and InAs surfaces. No evidence of such a state for As-2 molecules was found. On the basis of the data on specie-separated outgoing arsenic fluxes a simple model has been proposed for the analysis of arsenic molecules adsorption, desorption and incident arsenic beam reflection. The desorption rate constant and the maximum sticking coefficient of the arsenic molecules were determined from the experimental data of Brennan et al. [J. Vac. Sci. Technol. A 10 (1992) 33]. It was found that the desorption rate constant was dependent on the surface reconstruction. The results of calculations performed using this model are compared to the data on sticking coefficient and arsenic coverage of the surface obtained in the independent experiments.

Keywords: Adsorption Kinetics, Aluminum Arsenide, Gallium Arsenide, Indium Arsenide, Physical Adsorption, Semi-Empirical Models and Model Calculations, Sticking, Energy Electron-Diffraction, Scanning Tunneling Microscopy, 100 Gaas Surfaces, Beam Epitaxy, Interaction Kinetics, Reflection, Stoichiometry, Reconstruction, Desorption, Growth

Tochihara, H. and Mizuno, S. (1996), Hybrid surface structures formed on Cu (001) and Ag (001) by alkali-metal adsorption. *Surface Science*, **357-358** (1-3), 10-18.

Full Text: [S\Sur Sci357-358, 10.pdf](S/Sur%20Sci357-358,%2010.pdf)

Abstract: We have determined the surface structure sequence 2×1--> 3×3--> 4×4 formed on Cu (001) with increasing Li coverage at 300 K by using low-energy electron diffraction analysis. Zn the 2×1 structure all Li atoms occupy substitutional sites, whereas the 3×3 and 4×4 structure similar to each other contain both substitutional Li atoms and Li adatoms. It is concluded that the surface accommodates additional Li atoms at the cost of the average adsorption energy in the sequence above. Another sequence 2×1--> 3×3 is found for Na adsorption on Ag (001) at room temperature. The 3×3 surface structure is considered to be the same one formed in Cu (001)-Li. Different sequence 2×1--> 3×1 is observed for K adsorption on Ag (001). Structure models for the 3×1 is proposed. We conclude that the 3×3 and 3×1 structures following the same 2×1 structure are formed basically due to the same cause and that different structures are realized owing to the size effect.

Aizawa, T., Hayami, W., Souda, R., Otani, S., Tanaka, T. and Ishizawa, Y. (1996), Molecular adsorption of oxygen on transition-metal carbide. *Surface Science*, **357-358** (1-3), 645-650.

Full Text: [S\Sur Sci357-358, 645.pdf](S/Sur%20Sci357-358,%20645.pdf)

Abstract: Room-temperature oxygen adsorption on NbC (111) and WC (<10 (1)over bar 0>) was studied by high-resolution electron energy loss spectroscopy and ultraviolet photoelectron spectroscopy. On NbC (111), oxygen is adsorbed dissociatively at the first stage. Above 2×10-4 Pa.s of exposure, a molecular species appears, which shows O-O stretching and M-O-Obending vibrations at 122 and 89 meV. These peaks disappear at 300°C. When the NbC (111) surface is saturated by dissociative N atoms prior to the oxygen adsorption, the molecular adsorption occurs from the first stage. This suggests that the molecular adsorption is caused by a site-blocking mechanism. On the other hand, oxygen is adsorbed molecularly on WC (<10 (1) over bar 0>) from the first. The UPS shows a broad peak at-6.5 eV from the Fermi level, which is consistent with the 1 pi (u) and 3 sigma (g) orbitals of the molecular oxygen species.

Schilbe, P., Siebentritt, S., Pues, R. and Rieder, K.H. (1996), Adsorption of hydrogen and of oxygen on an open metalsurface-HREELS investigation at Ni(311). *Surface Science*, **360** (1-3), 157-170.

Full Text: [S\Sur Sci360, 157.pdf](S/Sur%20Sci360,%20157.pdf)

Abstract: The adsorption behavior of hydrogen and oxygen on the stepped Ni (311) surface has been investigated by HREELS. A series of metastable phases was found for hydrogen adsorption at low temperatures with a succession of different adsorption sites indicated by the following loss peaks: 55 and 149 meV for the threefold site, shirting with higher coverage to 65 and 155 meV, respectively, 40 and 90 meV for the fourfold site, shifting to 35 and 85 meV with coverage, and 110 and 124 meV for an additional site between close packed rows. Room temperature adsorption of hydrogen leads to the reconstruction of the surface with occupation of three-and fourfold sites, represented by loss peaks at 60 and 145 meV for the threefold site and 74 meV for the fourfold site. This phase is the thermodynamically stable one. Oxygen is most likely initially adsorbed on a bridge site (loss peak at 66 meV). The stepped surface is already oxidized at very low exposures to oxygen, as seen by the characteristic vibration for oxide islands at 55 meV and later by the Fuchs-Kliewer mode of NiO at 68 meV.

Gross, A. (1996), Dynamical quantum processes of molecular beams at surfaces: Dissociative adsorption of hydrogen on metalsurfaces. *Surface Science*, **363** (1-3), 1-10.

Full Text: [S\Sur Sci363, 1.pdf](S/Sur%20Sci363,%201.pdf)

Abstract: Due to the improvement of computer power and the development of efficient algorithms it is now possible to combine high-dimensional quantum dynamical calculations of the dissociative adsorption of molecular beams with reliable ab-initio potential energy surfaces (PES). In this brief review two recent examples of such studies of the systems H2/Cu (lll), where adsorption is hindered by a noticeable energy barrier, and H2/Pd (100), where activated as well as non-activated paths to adsorption exist, are presented. The effect of lateral surface corrugation on the sticking probability in the tunneling and the classical regime and the role of additional parallel momentum are discussed in the context of the H2/Cu (lll) results. For the system H2/Pd (100) it is shown that the initial decrease of the sticking probability with increasing kinetic energy, which is usually attributed to a precursor mechanism, can be explained by dynamical steering. In addition, the influence of rotation on the adsorption and desorption dynamics is examined.

Dvorak, J., Borguet, E. and Dai, H.L. (1996), Monitoring adsorption and desorption on a metalsurface by optical non-resonant reflectivity changes. *Surface Science*, **369** (1-3), L122-L130.

Full Text: [S\Sur Sci369, L122.pdf](S/Sur%20Sci369,%20L122.pdf)

Abstract: A linear optical reflection technique is demonstrated as a simple and non-intrusive means for monitoring the adsorption and desorption of carbon monoxide on Cu (100). The non-resonant reflectivity change induced by CO adsorption on copper is of the order of-1%, allowing submonolayer sensitivity of 0.01 ML to be achieved. The induced reflectivity change exists over a broad frequency range, and is found to correlate linearly with the coverage in both the infrared (lambda = 4.76 µm) and the visible (lambda = 632.8 nm). CO adsorption is found to proceed with a constant sticking coefficient up to a coverage of 0.5 ML, after which Langmuir adsorption kinetics are followed. The changes in the adsorption kinetics correlate quantitatively with structural changes in the CO monolayer. This technique monitors the surface coverage directly, and is simple and inexpensive to implement. As an optical surface probe it allows time-resolved measurements and can be extended to high-pressure environments.

Davydov, S.Y. and Tikhonov, S.K. (1997), On the cohesive approach to the calculation of d-metal on d-metal adsorption properties. *Surface Science*, **371** (1), 157-167.

Full Text: [S\Sur Sci371, 157.pdf](S/Sur%20Sci371,%20157.pdf)

Abstract: The binding (adsorption) energy of a d-metal atom adsorbed on a d-metalsubstrate is treated as a cohesive energy of the adatom. Adsorption, surface diffusion activation and adatom-adatom (s) interaction energies for all transition metals on W (110) are calculated on the basis of the Harrison-Wills theory of cohesion.

Aizawa, T., Hayami, W., Souda, R., Otani, S. and Ishizawa, Y. (1997), Hydrogen adsorption on transition-metal carbide (111) surfaces. *Surface Science*, **381** (2-3), 157-164.

Full Text: [S\Sur Sci381, 157.pdf](S/Sur%20Sci381,%20157.pdf)

Abstract: Vibrational frequency of H and D adsorbed on IVa and Va transition-metal carbide (TMC) (111) surfaces has been studied by high-resolution electron energy loss spectroscopy. Hydrogen (deuterium) was adsorbed dissociatively, showing the vibrational mode in an energy range of 110-120 (80-88) meV on ZrC (111), HfC (111) and NbC (111) surfaces, but at a much higher energy of 208 (149) meV on TaC (111). The former is similar to the case of H/TiC (111) consistent with three-fold hollow site adsorption. The latter seems too high to be explained by a variation of the force constant. It seems likely that on TaC (111), hydrogen is adsorbed on a different site from the other H/TMC (111) systems.

Bukhtiyarov, V.I., Carley, A.F., Dollard, L.A. and Roberts, M.W. (1997), XPS study of oxygen adsorption on supported silver: Effect of particle size. *Surface Science*, **381** (2-3), L605-L608.

Full Text: [S\Sur Sci381, L605.pdf](S/Sur%20Sci381,%20L605.pdf)

Abstract: The suggestion that two types of oxygen species are necessary for ethylene epoxidation is investigated using a model carbon-supported silver catalyst. It is established that the relative populations of the nucleophilic and electrophilic oxygen species are strongly dependent on silver particle size, the nucleophilic oxygen only being observed for cluster sizes greater than 300 Angstrom. The observation that the two types of oxygen only co-exist on large silver particles is consistent with reported epoxidation rates for silver catalysts. (C) 1997 Elsevier Science B.V.

Keywords: Carbon, Chemisorption, Clusters, Oxygen, Silver, Soft X-Ray Photoelectron Spectroscopy, Ethylene Epoxidation, Partial Oxidation, Metal-Clusters, Surface, Spectroscopy, Mechanism, Catalysis, Ag(110)

Roelofs, L.D. and Fromowitz, D.B. (1997), Interacting depolarizable adatoms on a triangular lattice: A model for alkali metal adsorption on FCC (111) and HCP (0001) surfaces. *Surface Science*, **388** (1-3), 92-102.

Full Text: [S\Sur Sci388, 92.pdf](S/Sur%20Sci388,%2092.pdf)

Abstract: We investigate the phase diagram of adsorbed dipoles on a triangular lattice by means of Monte Carlo simulation. Our model incorporates depolarization and multiplicity of binding sites, effects thought to be important for describing the adsorption of alkali metal atoms on metalsurfaces. We successfully reproduce several important features of alkali-metal absorption systems including: the characteristic saturation in the work function decrease with coverage and the condensation behavior resulting from depolarization. We consider the T = 0 behavior for the general case and present the full condensation phase diagram for one set of parameters.

Fukutani, K. and Murata, Y. (1997), Photoexcited processes at metal and alloy surfaces: Electronic structure and adsorption site. *Surface Science*, **390** (1-3), 164-173.

Full Text: [S\Sur Sci390, 164.pdf](S/Sur%20Sci390,%20164.pdf)

Abstract: Photoexcited processes of NO and CO at photon energies ranging from 2.3 to 6.4 eV are investigated on Pt (111), Ni (111) and Pt (111)-Ge surface alloys by reflection-absorption infrared spectroscopy and resonance-enhanced multiphoton ionization. The branching between three competitive processes of desorption, recapture and dissociation upon laser irradiation is dramatically changed on the three surfaces. On Pt (111), NO is either photodesorbed or photodissociated depending on the coverage, while NO is exclusively photodissociated on Ni (111). UV-photon irradiation of NO on Pt (111)-Ge, on the other hand, induces only desorption of NO. Desorption of CO bound at the on-top site of Pt (111) is induced by laser irradiation. The electronic mechanism for photodesorption and competitive branching is discussed in terms of the electronic structure of the substrate and the adsorbate.

Koper, M.T.M. (1998), Isotherms of ionic adsorption at metal electrodes with coverage dependent lateral interactions due to mutual depolarization. *Surface Science*, **395** (1), L196-L200.

Full Text: [S\Sur Sci395, L196.pdf](S/Sur%20Sci395,%20L196.pdf)

Abstract: Isotherms are calculated for a simple modal describing ions absorbing onto a metal electrode, taking into account the effect of mutual depolarization. By mutual depolarization is meant the progressive discharge of the ions with increasing coverage, leading to weaker dipole-dipole lateral interactions. The mean-field isotherm predicts sigmoidal parts in the isotherm in the region of ionic discharge, which may even develop into hysteresis and first-order phase transitions. The qualitative predictions of the mean-field theory, in particular the first-order phase transition, are reproduced by Monte-Carlo simulations, but only if the lateral repulsive interactions are long ranged, as is expected for electrostatic interactions.

Ahdjoudj, J. and Minot, C. (1998), Adsorption of H2O on metal oxides: A periodic ab-initio investigation. *Surface Science*, **402-404**, 104-109.

Full Text: [S\Sur Sci402-404, 104.pdf](S/Sur%20Sci402-404,%20104.pdf)

Abstract: We present ab-initio periodic Hartree-Fock calculations of water molecules on TiO2 and MgO. On MgO, H2O does not dissociate and is adsorbed parallel to the surface. The main interaction concerns the Mg from the surface and the p pair of the water. At saturation, adsorbate-adsorbate interactions favor the formation of an ice monolayer. On TiO2 the water molecule is strongly adsorbed, dissociating to generate surfacehydroxyl groups. The reactivities of the two surfaces are compared and explained in terms of hard and soft acid and base theory.

Notes: highly cited

? Cai, W.B., Ren, B., Li, X.Q., She, C.X., Liu, F.M., Cai, X.W. and Tian, Z.Q. (1998), Investigation of surface-enhanced Raman scattering from platinum electrodes using a confocal Raman microscope: Dependence of surface roughening pretreatment. *Surface Science*, **406** (1-3), 9-22.

Full Text: [1998\Sur Sci406, 9.pdf](1998/Sur%20Sci406,%209.pdf)

Abstract: In order to establish an appropriate surface roughening procedure for obtaining high-quality surface Raman spectra from Pt electrodes, various roughening conditions for the SERS from the adsorbed pyridine, thiocynate and hydrogen are assessed in terms of the corresponding surface Raman intensities, enhancement factors and surface homogeneity. The repetitive square-wave oxidation reduction cycle (SWORC) triangular-wave ORC (TWORC) and platinization have been performed in the present study. The enhancement factor (G) is calculated based on the confocal feature of a confocal microprobe Raman system, showing one to two orders of amplification of Raman signal for adsorbed pyridine on roughened Pt surfaces. The involvement of charge transfer (CT) enhancement is inferred from the SERS intensity-potential profiles that are dependent on excitation lines. In general, the Pt surfaces with different roughness factors (R) can be divided into three categories: (1) the mildly roughened surface with R of 20-30 seems more adequate for the study of SERS mechnism including calculation of G. (2) the moderately roughened surface with R ranging from 20 to 100, providing homogeneous morphologies: is suitable for investigating surface adsorption and reactions, (3) the highly roughened surface with R ranging From 100 to 300, with non-uniform morphologies, could only be used for investigating species having small Raman cross-sections such as hydrogen adsorption. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: adsorption, AFM, Hydrogen, Platinum, Pyridine, Surface Raman Spectroscopy, Surface Roughening, Silver Electrode, Pyridine, Sers, Spectroscopy, Spectra, Spectroelectrochemistry, Roughness, Interface, Hydrogen, Metals

Pohl, M. and Otto, A. (1998), Adsorption and reaction of carbon dioxide on pure and alkali-metal promoted cold-deposited copper films. *Surface Science*, **406** (1-3), 125-137.

Full Text: [S\Sur Sci406, 125.pdf](S/Sur%20Sci406,%20125.pdf)

Abstract: The adsorption and reaction of carbon dioxide on pure and potassium-doped cold-deposited copper films has been investigated at low temperatures and under UHV conditions using surface enhanced Raman spectroscopy (SERS) and X-ray photoemission spectroscopy (XPS). On pure copper films, an activated anionic CO2 delta-species has been observed in addition to a weakly physisorbed CO2 species. On potassium-doped copper films, monodentate carbonate as well as carbon monoxide has been observed in addition to the two carbon dioxide species. After adsorbing CO2 on preadsorbed hydrogen, weak features at 2841 and 2949 cm-1 indicate the formation of formate. This result is compared to formate on pure copper films, synthesised by adsorbing formic acid on preoxidised copper films and subsequent annealing to 200 K.

Bełtowska-Brzezinska, M., Łuczak, T. and Holze, R. (1998), On adsorption of monohydric alcohols and diols at sp and sd metal electrodes. *Surface Science*, **418** (1), 281-294.

Full Text: [S\Sur Sci418, 281.pdf](S/Sur%20Sci418,%20281.pdf)

Abstract: A survey of studies on adsorption behaviour of monohydric alcohols and diols at the sp and sd metal electrode/aqueous solution interface is given. Particular attention is paid to the effect of the molecular structure of the surfactants (carbon chain length, number and arrangement of functional groups as well as multiple carbon-carbon bonds) on their interfacial arrangement and interactions.

Olivera, P.P., Patrito, E.M. and Sellers, H. (1998), Adsorption of sulfate, bisulfate and sulfuric acid on silver surfaces: A theoretical study. *Surface Science*, **418** (2), 376-394.

Full Text: [S\Sur Sci418, 376.pdf](S/Sur%20Sci418,%20376.pdf)

Abstract: The adsorption of sulfate, bisulfate and sulfuric acid is investigated on the 111, 110 and 100 surfaces of silver by means of ab initio calculations performed at the Hartree Fock + second order perturbation level of theory. We consider the following aspects of the adsorption process: binding energies on different surfaces and coordination sites, charge transfer and adsorbate relaxation. The adsorption of sulfate is studied in more detail on the three metal surfaces. Sulfate binding energies in the range 110-180 kcal/mol are calculated for the different surfaces and coordinations investigated. The highest binding energies were obtained for the more open 110 surface. On a given surface, coordination via three oxygen atoms is more stable than via only one. For bisulfate and sulfuric acid we obtained binding energies of 58 and 27 kcal/mol on the Ag(111) and Ag(100) surfaces, respectively. The charge transferred to the metal is 0.2 electrons for bisulfate and 0.4-0.6 electrons for sulfate. A linear relation was observed between the binding energy of H2SO4, HSO4- and SO42- and the square of their effective charge on the surface. This behavior is characteristic of image charge interactions between ions and metal surfaces. The calculated binding energies for the anions allowed us to establish appropriate thermodynamic cycles which show that the acidity of bisulfate is enhanced when adsorbed on the surface. When sulfate and bisulfate are allowed to relax on the surface, the geometry of the ions changes according to the conservation of bond order on metal surfaces: while the bonds between coordinated oxygens and the metal surface strengthen, the bonds between these oxygens and sulfur weaken, The contribution of the relaxation energy to the binding energy of the anions is between 5 and 10 kcal/mol. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: Ab Initio Quantum Chemical Methods and Calculations, Chemisorption, Single-Crystal Electrodes, Transform Infrared-Spectroscopy, Model Potential Method, In-Situ, Anion Adsorption, Pt(111) Electrode, Adsorbed Sulfate, Au(111) Electrode, Vibrational Spectroscopy, Polycrystalline Platinum

Prado, A.G.S., Miranda, B.S. and Jacintho, G.V.M. (2003), Interaction of indigo carmine dye with silica modified with humic acids at solid/liquid interface. *Surface Science*, **542** (3), 276-282.

Full Text: [S\Sur Sci542, 276.pdf](S/Sur%20Sci542,%20276.pdf)

Abstract: Two distinct humic acids, one extracted from Brazilian peat soil, HA(PS), and another one obtained from commercial source, HA(FL) were attachment onto silica gel modified with aminopropyltrimethoxysilane, producing two material named SiHA(PS) and SiHA(FL), respectively. The ability of these materials in removing indigo carmine dye from aqueous solution was followed through series of adsorption isotherms adjusted to modified Langmuir equation. The maximum number of moles adsorbed gave 6.82±0.12×10-4 and 2.15±0.17×10-4 mol g-1 for SiHA(PS) and SiHA(FL), respectively. Same interactions were calorimetrically followed and the thermodynamic data showed endothermic enthalpic values: 12.31±0.55 and 24.69±1.05 kJ mol-1 for SiHA(PS) and SiHA(FL) surfaces, respectively. Gibbs free energies for two adsorption processes of indigo carmine dye presented, negative values, reflecting dye/surface interactions must be accompanied by an increased in entropy values, which are 65±3 and 98±5 J mol-1 K-1 for SiHA(PS) and SiHA(FL) materials, respectively. The adsorption processes for both materials were spontaneous in nature although they presented an endothermic enthalpy for the interaction, resulting in an entropically favored process. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Aromatics, Silicon Oxides, Adsorption Isotherms, Heterogeneous Routes, Waste-Water, Gel, Substances, Adsorption, Cations, Separation, Oxidation, Surface

Fujimoto, N., Sinya, T., Seimiya, Y. and Asada, H. (2004), Adsorption of gases on SnS2: trace of order–disorder phase transition of a honeycomb lattice gas. *Surface Science*, **572** (2-3), 283-295.

Full Text: [S\Sur Sci572, 283.pdf](S/Sur%20Sci572,%20283.pdf)

Abstract: We have made volumetric measurements of adsorption isotherm of Ar, Kr, O2 and N2 on a powder sample of tin disulfide SnS2 in the temperature range of 77–90 K. Ar, Kr and O2 exhibited pressure isotherms unusually bending at the coverage of 0.3–0.4 monolayer, while N2 did not. The isotherms are analyzed by a quasi-chemical approximation theory developed for a honeycomb lattice gas with first nearest neighbor exclusion and with a small adsorption potential difference between the two (1×1)-1/2 sublattices. The unusual bending of the pressure isotherms is successfully explained as a trace of the order–disorder phase transition of second order that would take place in the honeycomb lattice gas if the two sublattices had the same adsorption potential. The adsorption potential difference is found to be at most of order of magnitude of the second nearest neighbor interaction energy.

Keywords: Adsorption Isotherms, Physical Adsorption, Surface Thermodynamics (Including Phase Transitions), Ising Models, Noble Gases, Sulphides, Oxygen, Powders

? Alessandrini, A., De Renzi, V., Berti, L., Barak, I. and Facci, P. (2005), Chemically homogeneous, silylated surface for effective DNA binding and hybridization. *Surface Science*, **582** (1-3), 202-208.

Full Text: [S\Sur Sci582, 202.pdf](S/Sur%20Sci582,%20202.pdf)

Abstract: We report on a method for covalent immobilization of 5’-thiol-modified single strand DNA probes, onto oxygen exposing surfaces by exploiting surface derivatization by 3-mercaptopropyltrimethoxysilane and subsequent intermolecular disulfide bond formation. The various steps in the formation of the molecular edifices have been characterized by X-ray photoelectron spectroscopy, quartz crystal microbalance and atomic force microscopy under liquid. Surface reaction kinetics of thiol-modified DNA probes with thiol-bearing silanes turned out to be a second-order one, possibly due to the presence of both free thiol and S-S dimers in solution. The ability of immobilized single strand DNA to bind the complementary strand has been tested and confirmed by quartz crystal microbalance measurements. The presented DNA immobilization method appears to be applicable to any surface bearing exposed hydroxyl moieties. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Surface Chemical Reaction, Oligonucleotide Immobilization, Atomic Force Microscopy, Quartz Crystal Microbalance, X-Ray Photoelectron Spectroscopy, Self-Assembled Monolayers, Atomic-Force Microscopy, Nucleic-Acids, X-Ray, Oligonucleotides, Immobilization, Microarrays, Films, Adsorption, Attachment

? Luo, M.F., MacLaren, D.A. and Allison, W. (2005), Migration and abstraction of H-atoms from the Cu(1 1 1) surface. *Surface Science*, **586** (1-3), 109-114.

Full Text: [S\Sur Sci586, 109.pdf](S/Sur%20Sci586,%20109.pdf)

Abstract: Isothermal measurements of the helium specular reflectivity from H–Cu(1 1 1) are used to demonstrate that adsorbed hydrogen is removed from the surface in an activated process according to first-order kinetics. The measurements were taken at low coverages with surface temperatures in the range of 210–245 K, where we derive an activation-energy of 64.3±1.3 kJ mol−1. The observation allows us to rule out second-order, molecular desorption processes and supports the conclusion that the H atoms are transported from surface to sub-surface sites by an activated process. The results confirm an earlier suggestion that, in the low coverage limit, the sub-surface state for this system is more energetically favourable than other states. In addition, the measurements suggest abstraction processes take place with a probability of (4.3±1.0)*s*0, where *s*0 is the initial sticking probability.

Keywords: Adsorption Kinetics, Atom–Solid Scattering and Diffraction, Hydrogen Atom, Copper, Molecule–Solid Reactions, Surface Structure

? Jayaweera, P.M. and Jayarathne, T.A.U. (2006), Acid/base induced linkage isomerization of alizarin red adsorbed onto nano-porous TiO2 surfaces. *Surface Science*, **600** (22), L297-L300.

Full Text: [2006\Sur Sci600, L297.pdf](2006/Sur%20Sci600,%20L297.pdf)

Abstract: Diffuse reflectance FTIR studies indicate that alizarin red (1,2-dihydroxy-9-10-anthraquinone sulfonic acid) undergoes reversible acid/base induced linkage isomerization on nano-porous TiO2 surfaces. It is also possible to convert molecules from surface orientation, ARS-(TiO2-1,9) to the ARS-(TiO2,-1,2) by thermal activation. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Alizarin Red, Diffuse Reflectance FTIR, Titanium Dioxide, Photovoltaic Cells, Adsorption, Photosensitization, Complexes, Mechanism, Isomers, Oxide

? Khanom, F., Khan, A.R., Rahman, F., Takeo, A., Goto, H. and Namiki, A. (2007), Reactions of atomic oxygen with the D-covered Si(100) surfaces. *Surface Science*, **601** (14), 2924-2930.

Full Text: [2007\Sur Sci601, 2924.pdf](2007/Sur%20Sci601,%202924.pdf)

Abstract: We have studied D abstraction by O on the D/Si(1 0 0) surfaces using a continuous as well as pulsed O-beams. Both D-2 and D2O molecules are detected during O-exposure. The D-2 desorption is found to take place more efficiently on the monodeute ride/dideuteride surface than on the monodeuteride surface. The pulsed beam experiments exhibit occurrence of both a slow and a fast D-2 desorption. The D2O desorption is found to obey the second-order rate law in theta(0)(D) on the monodeuteride surfaces and 3.5th-order rate law on the monodeuteride/dideuteride surfaces. The D2O desorption is found to be governed also by the second-order rate law, however regardless of D coverage even on the monodeuteride/dideuteride surfaces. Possible mechanisms for the O-induced desorption from the D/Si(1 0 0) surfaces are discussed. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Abstraction, D-2, Desorption, Deuterium Adsorption, Experiments, Hydrogen Desorption, Kinetics, Law, Mechanisms, Monohydride, Occurrence, Oxidation, Oxygen, Rate, Second Order, Si(100), Si(111) Surfaces, Silicon Surface, Spectroscopy, Surface, Surfaces, Terminated Si(100), Water Formation

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Full Text: [2008\Sur Sci602, 778.pdf](2008/Sur%20Sci602,%20778.pdf)

Abstract: Attapulgite was investigated to remove Ni2+ from aqueous solutions because of its strong sorption ability. Herein, the sample of attapulgite was modified with ammonium citrate tribasic (ACT) and used as an adsorbent to remove Ni2+ from aqueous solutions. XRD and FTIR analysis indicated that ACT was successfully grafted on attapulgite surfaces. The results indicated that ACT-attapulgite was better than bare attapulgite in the removal of Ni2+ from aqueous solutions. Sorption of Ni2+ on ACT-attapulgite was mainly dominated by ion exchange or outer-sphere complexes at low pH values, and by inner-sphere complexes or surface precipitation at high pH values. The thermodynamic data indicated that the sorption of Ni2+ to ACT-attapulgite hybrids was an endothermic process and was enhanced with increasing temperature. ACT-attapulgite is a suitable material for the preconcentration of Ni2+ from large volume of solutions and can be used in wastewater treatment because of its negative surface charge and large surface areas. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Attapulgite, Ni2+, Sorption, Thermodynamic Data, ACT, Aqueous-Solution, Equilibrium Parameters, Compacted Bentonite, Carbon Nanotubes, Batch Adsorption, Capillary Method, Humic-Acid, Maya-Blue, Palygorskite, Ni(II)

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Full Text: [2008\Sur Sci602, 1428.pdf](2008/Sur%20Sci602,%201428.pdf)

Abstract: The kinetics of isothermal desorption of hydrogen from InN(000 (1) over bar) have been investigated using surface vibrational spectroscopy. Reductions in intensity of the N-H stretching and bending vibrations in high resolution electron energy loss spectra (HREELS) upon annealing indicated loss of surface hydrogen and was attributed to recombinative desorption. Hydrogen completely desorbs from the InN surface upon annealing for 900 s at 425°C or upon annealing for 30 s at 500°C. Surface hydrogen coverage was determined using the intensity of the N-H stretching vibrational loss peak. Fitting the coverage versus temperature for anneals of either 30 or 900 s indicated that the desorption was best described by second-order desorption kinetics with an activation energy and pre-exponential factor of 1.3±0.2 eV and 10(-7.3±1.0) cm2/s, respectively. In addition to thermal desorption, an increase in the carrier concentration in the film was also observed upon annealing to 450°C or higher as shown in HREELS by a shift of the conduction band plasmon excitation to higher energy. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Chemical-Vapor-Deposition, Decomposition, Desorption, Desorption Kinetics, Electron Energy Loss Spectroscopy, Gan, Group-III Nitrides, Growth, Hydrogen, Indium Nitride, Inn, Kinetics, Layers, Rights, Spectroscopy, Surface Electron Accumulation, Temperature, Thin-Films

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Full Text: [2008\Sur Sci602, 1783.pdf](2008/Sur%20Sci602,%201783.pdf)

Abstract: The adsorption process of interacting binary gas mixtures containing particles A and B on triangular substrates is studied through grand canonical Monte Carlo simulation in the framework of the lattice-gas model. The energies involved in the adsorption process are four: (1) epsilon(0), interaction energy between a monomer (type A or B) and a lattice site, (2) W-AA, nearest-neighbor interaction energy between two A particles, (3) W-AB (=W-BA), nearest-neighbor interaction energy between an A particle and a B particle and (4) W-BB, nearest-neighbor interaction energy between two B particles. The process is monitored through partial and total isotherms, differential heats of adsorption and energy of the system, which appear as very sensitive to all lateral interactions. We focus on the case of repulsive lateral interactions, where a rich variety of structural orderings are observed in the adlayer, depending on the value of the parameters W-AA, W-AB and W-BB. Results are rationalized through the determination of the phase diagrams characterizing second order phase transitions in the system. A nontrivial interdependence between the partial surface coverage of both species is observed. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Binary-Mixtures, Calorimetric Heats, Emery-Griffiths Model, Framework, Gas, Gas Mixture Adsorption, Heterogeneous Surfaces, Interaction, Ising-Model, Isotherms, Lattice-Gas Models, Model, Monte Carlo, Monte Carlo Simulation, Multicritical Phase-Diagrams, Particles, Rights, Second Order, Second-Order, Silicalite, Simulation, Transition

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Full Text: [2008\Sur Sci602, 1979.pdf](2008/Sur%20Sci602,%201979.pdf)

Abstract: The abstraction reaction of D adatoms by H atoms have been investigated on the Si(1 10) surfaces. The direct abstraction to form HD molecules obeys a second-order rate law in D coverage 0(D), On the other hand, the indirect abstraction to form D-2 molecules obeys a fourth-order rate law in 0(D). In addition to the direct abstraction, indirect abstraction to form HD molecules is also included due to piled H adatoms during H exposure. It is found that the indirect abstraction is promoted on the surfaces saturated with dideuterides, suggesting that dideuterides (dihydrides) play a significant role in the indirect abstraction paths. The kinetics of the abstraction reactions on the Si(1 10) surfaces look similar to those on the Si(1 00) surface. However, the delayed D-2 desorption exhibits time profiles different from those on the Si(1 00) surfaces. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: 573 K, Adsorption, Amorphous-Silicon, Atom-Solid Interactions, Desorption, Desorption-Kinetics, Deuterium, Eley-Rideal Mechanism, Exposure, FTIR, H-Atoms, H-Sticking, HD, Hot Complex, Hydrogen, Kinetics, Law, Momentary Coverages, Phase, Plasma Processing, Rate Law, Reconstruction, Rights, Scanning-Tunneling-Microscopy, Second Order, Second-Order, Si(100) Surfaces, Thermal Desorption, Time Response

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Full Text: [2010\Sur Sci604, 2184.pdf](2010/Sur%20Sci604,%202184.pdf)

Abstract: Employing ultraviolet photoelectron spectroscopy (UPS He I) the more surface sensitive metastable Impact electron spectroscopy (MIES) and temperature programmed desorption (TPD) measurements of the adsorption properties of the pollutant trichloroethylene (TCE) on thin MgO(100) films grown on a Mo (100) single crystal have been investigated From TPD spectra of different coverages it is concluded that TCE interacts only weakly with MgO which is attributed to physisorption For increasing coverages a change from one peak to two peaks in the TPD spectra one at higher the second at lower temperatures with respect to the single peak is detected Additionally the observation of a local minimum for the work function (WF) for both MIES and UPS spectra is presented Such a local minimum has been reported previously for the adsorption of metals with outer s valence electrons on transition metal substrates and adsorption of metals with outer s valence electrons on metal oxide films Herein we present the first WF minimum observed for a system of organic molecules adsorbed on an insulating surface Two different models are discussed in order to understand the presented results (C) 2010 Elsevier B V All rights reserved.

Keywords: Adsorption, Alkali-Metal Adsorption, Clusters, Desorption, Ionization Electron-Spectroscopy, Mechanism, Metals, MgO, MgO Surfaces, Mies, Models, Molecules, Oxide, Oxide Surfaces, Physisorption, Properties, System, TCE, Temperature, Thin-Films, TPD, Trichloroethylene, Trichloroethylene (TCE), Ultraviolet Photoelectron, Ups (He I)

# Title: Surface Science Reports

Full Journal Title: Surface Science Reports

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Notes: highly cited

? Campbell, C.T. (1997), Ultrathin metal films and particles on oxide surfaces: Structural, electronic and chemisorptive properties. *Surface Science Reports*, **27** (1-3), 1-111.

Full Text: [1997\Sur Sci Rep27, 1.pdf](1997/Sur%20Sci%20Rep27,%201.pdf)

Abstract: Ultrathin metal films on clean and well-defined oxide surfaces have been prepared by several groups using vapor deposition techniques in ultrahigh vacuum, and the structural, electronic and chemisorptive properties of these films have been characterized using a variety of surface science techniques. Those studies will be reviewed here, and trends in these properties will be identified. While films of mid- or late-transition metals can sometimes be grown in a quasi-layer-by-layer fashion at very low temperatures where kinetics prevail, heating these usually leads to thickening into the thermodynamically preferred structure: three-dimensional metal particles that cover only a fraction of the oxide surface. This occurs in two stages: individual island thickening, then Ostwald ripening. The kinetics of growth, nucleation and thickening will be examined. In some cases, this thermodynamic preference can be shifted to favor complete spreading of the metal film by adding gas molecules. This is driven by the higher adsorption energy of the molecule on the metal sites. Early transition metals which have very stable oxides can partially reduce the substrate oxide, and themselves become oxidized. The chemisorption properties of metal overlayers correlate well with their structural and electronic properties. Sites formed by neutral metal adatoms in these films on oxide surfaces often have chemisorption properties resembling that of some bulk metal crystalline plane. Surprisingly, this is even true for metal islands that are only one atom thick, in which case they resemble a very open or coordinatively unsaturated plane. However, the sites on and in the nearby oxide can alter the final surface chemistry, because adsorbates, especially hydrogen adatoms, can diffuse rapidly from the metal particles to these sites (spillover). While some real advances have already been made, many fundamental questions which are of great importance in oxide-supported metal catalysis and other fields remain to be addressed with this approach.

Keywords: Metal Films, Metal Particles, Oxides, Single-Crystal, Chemisorption, Catalysts, Model, Reflection-Absorption Spectroscopy, Temperature-Programmed Desorption, Supported Palladium Catalysts, Ray Photoelectron Diffraction, Scanning-Tunneling-Microscopy, Rh/Al2O3 Model Catalyst, Single-Crystal Surfaces, By-Layer Growth, Cu Films, Carbon-Monoxide

# Title: Surface Technology

Full Journal Title: [Surface Technology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7327&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=dc32f377b1ec307e5025a1ccb215c4f9)

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Komerwar, A.M. and Sinha, B.P. (1980), The adsorption of cationic dyes on hydrated zirconium oxide. *Surface Technology*, **10** (2), 115-121.

Full Text: [S\Sur Tec10, 115.pdf](S/Sur%20Tec10,%20115.pdf)

Abstract: The adsorption of Victoria blue, malachite green and methyl violet 6B on fresh hydrated ZrO2 prepared in various conditions was studied. Hydrated ZrO2 prepared by the addition of excess NaOH for precipitation shows the greatest adsorption capacity for the cationic dyes. The adsorption is considered to be mainly an ion exchange process. The effects of temperature and aging were also studied. Although a decrease in the adsorption capacity of hydrous oxide with aging was observed, the samples still showed good adsorption capacities for the dyes even after five weeks. Our investigations show the suitability of hydrated ZrO2 as an adsorbent for the removal of dyes from waste.

# Title: Surfaces, Interfaces, and Colloids: Principles and Applications

John Wiley & Sons, Inc.

? Myers, D. (1999), *Surfaces*, *Interfaces*, *and Colloids: Principles and Applications*, (Second Edition), John Wiley & Sons Inc.

Full Text: [S\Sur Int Col, 9 Adsorption.pdf](S/Sur%20Int%20Col,%209%20Adsorption.pdf)

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# Title: Surgeon-Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland

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? Reddy, M.S., Srinivas, S., Sabanayagam, N. and Balasubramanian, S.P. (2008), Accuracy of references in general surgical journals - An old problem revisited. *Surgeon-Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland*, **6** (2), 71-75.

Full Text: [2008\Sur-J Roy Col Sur Edi Ire6, 71.pdf](2008/Sur-J%20Roy%20Col%20Sur%20Edi%20Ire6,%2071.pdf)

Abstract: Background: Reference errors in biomedical journals are well documented. Increasing use of electronic databases and bibliographic software May change the nature and frequency of errors. Aim: To study the current incidence of reference errors in four major general surgical journals. Methods: Seventy-five references were randomly selected from original articles published in one issue of each of four general surgical journals. For each reference, ease of retrieval on PubMed (TM) and the presence of citation errors were, noted. Two observers- independently reviewed each reference for quotation errors. Results: of the 300 Selected references, 261 from indexed English language biomedical journals were analysed. Retrieval from PubMed (TM) was impossible or difficult in six instances, giving a major citation error rate of 2.3%. Overall (major and minor) citation error rate was 11.1%. of the 258 references that could be retrieved, 20 (7.8%) had quotation errors, 80% of which were considered major. The overall citation error rate was significantly different across the four journals. There was moderate correlation between quotation error rate and number of references in each original article. Conclusion: Errors in references still appear in current surgical literature. Solutions to address this problem have been discussed.

Keywords: Biomedical, Biomedical Journals, Change, Citation, Citation, Citation Error, Citation Errors, Correlation, Databases, Error, Error Rate, Errors, General, General Surgery, Incidence, Journals, Language, Literature, Minor, Observers, Pubmed, Quotation, Quotation, Quotation Error, Quotation Errors, Reference, Reference Errors, References, Software, Surgery

# Title: Surgery

Full Journal Title: [Surgery](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7155&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=6bd562470bf8fcf6bc3b6bd84de1dbcb)

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Lazarides, M.K., Drista, H., Arvanitis, D.P. and Dayantas, J.N. (2002), Aortic aneurysm rupture after extracorporeal shock wave lithotripsy. *Surgery*, **122** (1), 112-113.

Full Text: [S\Surgery122, 112.pdf](S/Surgery122,%20112.pdf)

Sarr, M.G. and Warshaw, A.L. (2002), Responsibility of authorship. *Surgery*, **132** (3), 521.

Full Text: [S\Surgery132, 521.pdf](S/Surgery132,%20521.pdf)

? Housri, N., Cheung, M.C., Gutierrez, J.C., Zimmers, T.A. and Koniaris, L.G. (2008), SUS/AAS abstracts: What is the scientific impact? *Surgery*, **144** (2), 322-331.

Full Text: [2008\Surgery144, 322.pdf](2008/Surgery144,%20322.pdf)

Abstract: Aim. To evaluate the scientific impact of presentations, at the annual meetings of the Society of University Surgeons (SUS) and the Association for Academic Surgery (AAS). Methods. All Abstracts presented, at the 2002-2004 annual conferences were examined for publication rate (PR), publication citation (PC) and journal impact factor (IF). Results. Overall, 1200 abstracts from the SUS (n = 543, 45 %) and AAS (n = 657,55 %) were reviewed. One way ANOVA analysis of SUS results across session types demonstrated significant differences in PR (89 % plenary, 81 % parallel, 100 % basic science, 47 % resident conference, poster 76 %, p < 0.0001), but no difference in,PC (12.96 plenary, 9.66 parallel, 7.77 basic science, 8.23 resident conference, 8.21 poster, p = 0.25561) or IF (4.17 plenary, 3.50 parallel, 2.66 basic science, 3.12 resident conference 3.13 poster, p = 0.3947). AA S results demonstrated significant differences for PR (81 % plenary, 62 % parallel and 43 % poster, p < 0.0001), CR (8.33 plenary, 4.81 parallel, and 4.78 poster, p = 0.006) and IF (3.75 plenary, 2.64 parallel, and 2.73 poster, p = 0.0124). Comparison of abstracts between meetings demonstrated a higher overall PR, CR and IF for SUS publications (p < 0.0001). Conclusion. These data suggest that SUS and, AAS presentations constitute high-quality research, Trends towards higher PR, PC and IF for plenary sessions indicate that the review process properly stratifies. research. Statistically higher impact measures for SUS presentations are consistent with the more mature research careers of SUS members.

Keywords: Analysis, ANOVA, Careers, Citation, Conferences, CR, Data, Impact, Impact Factor, Journal, Journal Impact, Journal Impact Factor, Publication, Publications, Research, Resident, Review, Review Process, Science

? Mofidi, R., Suttie, S.A., Patil, P.V., Ogston, S. and Parks, R.W. (2009), The value of procalcitonin at predicting the severity of acute pancreatitis and development of infected pancreatic necrosis: Systematic review. *Surgery*, **146** (1), 72-81.

Full Text: 2009\Surgery146, 72.pdf

Abstract: Background. Many studies have evaluated serum levels of procalcitonin (PCT) as a predictor in the development of severe acute pancreatitis (SAP) and infected pancreatic necrosis (H-W). This study assesses the value of PCT as a marker of development of SAP and IPN. Methods. MEDLINE, Web of Science, the Cochrane clinical trials register, and international conference proceedings were searched systematically for prospective studies, which evaluated the usefulness of PCT as a marker of SAP and IPN. The sensitivity, specificity, and diagnostic odds ratios (DORs) were calculated for each study, and the study quality and heterogeneity among the studies were evaluated. Results. Twenty-four of 59 studies identified were included in data extraction. The sensitivity and specificity of PCT for development of SAP were 0.72 and 0.86, respectively (area under the curve [AUC] = 0.87; DOR = 14.9; 95% confidence interval [CI] = 5.6-39.8), albeit with a significant degree of heterogeneity Q = 28.56, P .01). The sensitivity and specificity of PCT for prediction of infected pancreatic necrosis were 0.80 and 0.91 (AUC = 0.91; DOR = 28.3; 95% CI = 13.8-58.3) with no significant heterogeneity Q = 7.83, P = .18). No significant heterogeneity was observed among the studies when only higher quality studies (AUC = 0.91; DOR = 30.7; 95% CI = 10. 7-87.8) or studies that used a cutoff PCT level >0.5 ng/mL (AUC = 0.88, 32.8; 95% CI = 10.1-106.6) were included. Conclusion. Serum measurements of PCT may be valuable in predicting the severity of acute pancreatitis and the risk of developing infected pancreatic necrosis. (Surgery 2009;146:72-81.).

Keywords: Acute, Acute Necrotizing Pancreatitis, Acute Pancreatitis, Antibiotic-Treatment, C-Reactive Protein, Clinical Trials, Cochrane, Controlled Clinical-Trial, Development, Diagnostic Relevance, Dysfunction, Inflammatory Response, Metaanalysis, Methods, Multicenter, Prospective Studies, Review, Risk, Science, Sensitivity, Sensitivity and Specificity, Serum Procalcitonin, Specificity, Systematic, Systematic Review, Web of Science

# Title: Surgery Gynecology & Obstetrics

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Notes: highly cited

? Allison, P.R. (1951), Reflux esophagitis, sliding hiatal hernia, and the anatomy of repair. *Surgery Gynecology & Obstetrics*, **92** (4), 419-431.

# Title: Surgical Endoscopy and Other Interventional Techniques

Full Journal Title: [Surgical Endoscopy and Other Interventional Techniques](http://www.springerlink.com/content/100368/?sortorder=asc&p_o=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Olsen, S.B., Sheikh, A., Peck, D. and Darzi, A. (2005), Variant Creutzfeldt-Jakob disease, a cause for concern - Review of the evidence for risk of transmission through abdominal lymphoreticular tissue surgery. *Surgical Endoscopy and Other Interventional Techniques*, **19** (6), 747-750.

Full Text: [2005\Sur End Int Tec19, 747.pdf](2005/Sur%20End%20Int%20Tec19,%20747.pdf)

Abstract: Background: Concerti has long existed regarding the possible iatrogenic spread of variant Creutzfeldt-Jakob disease (v-CJD) through surgery. This had been fueled by recent reports of bovine spongiform encephalopathy in U.S. cattle and the first probable case of blood transmission of v-CJD in the UK. Methods: Systematic review of experimental and non-experimental Studies. Studies identified from searches of Medline. Embase. Cochrane Library. Science Citation Index medical databases, searching bibliographies of retrieved papers, and personal communication with international experts in the field. Results: Six articles satisfied our search criteria. Evidence stems from case reports, case series, and cross-sectional Studies. There are no published cases of surgically transmitted v-CJD. Conclusion: We found evidence of v-CJD prion agents in the spleen, appendix. rectum, and adrenal glands of affected patients and evidence of v-CJD priori in the appendix of patients in the preclinical stage of the disease. The risk of transmission of v-CJD prion during abdominal surgery is Currently unquantifiable.

Keywords: Accumulation, Appendix, Articles, Bibliographies, Case Reports, Case Series, Citation, Communication, Criteria, Databases, Evidence, Infectivity, International, Lymphoreticular, Medical, Medline, Prion-Protein, Prions, Review, Risk, Samples, Science, Science Citation Index, Scrapie, Surgery, Systematic Review, Tonsil Biopsy, Transmission, UK, V-CJD

? Memon, M.A., Khan, S., Yunus, R.M., Barr, R. and Memon, B. (2008), Meta-analysis of laparoscopic and open distal gastrectomy for gastric carcinoma. *Surgical Endoscopy and Other Interventional Techniques*, **22** (8), 1781-1789.

Full Text: [2008\Sur End Int Tec22, 1781.pdf](2008/Sur%20End%20Int%20Tec22,%201781.pdf)

Abstract: Objectives The aim was to conduct a meta-analysis of the randomized evidence to determine the relative merits of laparoscopic assisted (LADG) and open (ODG) distal gastrectomy for proven gastric cancer. Data sources and review methods A search of the Medline, Embase, Science Citation Index, Current Contents, and PubMed databases identified all randomized clinical trials (RCTs) that compared LADG and OGD and were published in the English language between January 1990 and the end of June 2007. The meta-analysis was prepared in accordance with the Quality of Reporting of Meta-analyses (QUOROM) statement. The eight outcome variables analysed were operating time, blood loss, retrieval of lymph nodes, oral intake, hospital stay, postoperative complications, tumor recurrence, and mortality. Random effects meta-analyses were performed using odds ratios (OR) and weighted mean differences (WMD). Results Four trials were considered suitable for meta-analysis. A total of 82 patients underwent LADG and 80 had ODG. For only one of the eight outcomes, the summary point estimates favoured LADG over ODG, there was a significant reduction of 104.26 ml in intraoperative blood loss for LADG (WMD, -104.26, 95% confidence interval (CI) -189.01 to -19.51, p = 0.0159). There was however a 83.08 min longer duration of operating time for the LADG group compared with the ODG group (WMD 83.08, 95% CI 40.53 to 125.64, p = 0.0001) and significant reduction in lymph nodes harvesting of 4.34 lymph nodes in the LADG group (WMD -4.3, 95% CI -6.66 to -2.02, p = 0.0002). Other outcome variables such as time to commencement of oral intake (WMD -0.97, 95% CI -2.47 to 0.54, p = 0.2068), duration of hospital stay (WMD -3.32, 95% CI -7.69 to 1.05, p = 0.1365), rate of complications (OR 0.66, 95% CI 0.27 to 1.60, p = 0.3530), mortality rates (OR 0.94, 95% CI 0.21 to 4.19, p = 0.9363), and tumor recurrence (OR 1.08, 95% CI 0.42 to 2.79, p = 0.8806) were not found to be statistically significant for either group. However, for commencement of oral intake, duration of hospital stay, and complication rate, the trend was in favor of LADG. Conclusion LADG was associated with a significantly reduced rate of intraoperative blood loss, at the expense of significantly longer operating time and significantly reduced lymph node retrieval compared to its open counterpart. Mortality and tumor recurrence rates were similar between the two groups. Furthermore, time to commencement of oral intake, postprocedural discharge from hospital, and perioperative complication rate, although not significantly different between the two groups, did suggest a positive trend toward LADG. Based on this meta-analysis, the authors cannot recommend the routine use of LADG over ODG for the treatment of distal gastric cancer. However, significant limitations exist in the interpretation of this data due to the limited number of published randomised control trials, the small sample sizes to date, and the limited duration of follow up. Further large multicentre randomized controlled trials are required to delineate significantly quantifiable differences between the two groups.

Keywords: Bias, Blood-Transfusion, Cancer, Cancer Surgery, Cholecystectomy, Citation, Clinical Trials, Comparative Studies, Comparing Open, Databases, Discharge, English, Gastrectomy, Gastric Cancer, Groups, Hospitalization, Human, Interpretation, Intraoperative Complications, Language, Laparoscopic Method, Lymph-Node Dissection, Medline, Meta-Analysis, Methods, Mortality, Outcomes, Patient Outcome, Positive, Postoperative Complications, Pulmonary-Function, Quality, Randomized Clinical Trials, Randomized Controlled Trials, Randomized Controlled-Trials, Reduction, Resections, Review, Science, Science Citation Index, Treatment

? Petrov, M.S., Uchugina, A.F. and Kukosh, M.V. (2008), Does endoscopic retrograde cholangiopancreatography reduce the risk of local pancreatic complications in acute pancreatitis? A systematic review and metaanalysis. *Surgical Endoscopy and Other Interventional Techniques*, **22** (11), 2338-2343.

Full Text: [2008\Sur End Int Tec22, 2338.pdf](2008/Sur%20End%20Int%20Tec22,%202338.pdf)

Abstract: Background Recent studies have added to the controversy regarding the role of endoscopic retrograde cholangiopancreatography (ERCP) in the management of patients with acute biliary pancreatitis. This debate is due in part to a marked difference between the trials regarding the definition of “complication” as an outcome. This study sought to determine the effect of early ERCP versus conservative treatment on local pancreatic complications (defined by the current classification) experienced by patients with acute biliary pancreatitis. Methods Electronic databases (Cochrane Central Register of Controlled Trials, MEDLINE, Science Citation Index) and conference proceedings were searched for relevant randomized controlled trials up to December 2007. The effect of both treatment strategies on local pancreatic complications was calculated with random-effects models. Results Five trials involving 717 patients were included in this systematic review. Pooled analysis of all the patients with acute pancreatitis did not demonstrate a statistically significant difference between the two treatment strategies (relative risk [RR], 0.94, 95% confidence interval [CI], 0.63-1.40, p = 0.62). Similar results were observed after subgroup analysis based on the severity of disease as follows: mild acute pancreatitis (RR, 0.79, 95% CI, 0.26-2.47, p = 0.69), severe acute pancreatitis (RR, 0.77, 95% CI, 0.30-1.98, p = 0.59). Conclusion The early use of ERCP did not result in a significantly reduced risk of local pancreatic complications for either patients with mild acute pancreatitis or those with severe form of the disease.

Keywords: Acute Biliary Pancreatitis, Acute Pancreatitis, Cholangiography, Citation, Conservative Management, Databases, Endoscopic Retrograde Cholangiopancreatography, ERCP, Gallstone Pancreatitis, Management, Medline, Metaanalysis, Obstruction, Pancreatic Complications, Randomized Clinical-Trial, Review, Science, Science Citation Index, Sphincterotomy, Systematic Review, Ultrasonography, Ultrasound

? Schout, B.M.A., Hendrikx, A.J.M., Scheele, F., Bemelmans, B.L.H. and Scherpbier, A.J.J.A. (2010), Validation and implementation of surgical simulators: A critical review of present, past, and future. *Surgical Endoscopy and Other Interventional Techniques*, **24** (3), 536-546.

Full Text: 2010\Sur End Int Tec24, 536.pdf

Abstract: In the past 20 years the surgical simulator market has seen substantial growth. Simulators are useful for teaching surgical skills effectively and with minimal harm and discomfort to patients. Before a simulator can be integrated into an educational program, it is recommended that its validity be determined. This study aims to provide a critical review of the literature and the main experiences and efforts relating to the validation of simulators during the last two decades. Subjective and objective validity studies between 1980 and 2008 were identified by searches in PUBMED, Cochrane, and Web of Science. Although several papers have described definitions of various subjective types of validity, the literature does not offer any general guidelines concerning methods, settings, and data interpretation. Objective validation studies on endourological simulators were mainly characterized by a large variety of methods and parameters used to assess validity and in the definition and identification of expert and novice levels of performance. Validity research is hampered by a paucity of widely accepted definitions and measurement methods of validity. It would be helpful to those considering the use of simulators in training programs if there were consensus on guidelines for validating surgical simulators and the development of training programs. Before undertaking a study to validate a simulator, researchers would be well advised to conduct a training needs analysis (TNA) to evaluate the existing need for training and to determine program requirements in a training program design (TPD), methods that are also used by designers of military simulation programs. Development and validation of training models should be based on a multidisciplinary approach involving specialists (teachers), residents (learners), educationalists (teaching the teachers), and industrial designers (providers of teaching facilities). In addition to technical skills, attention should be paid to contextual, interpersonal, and task-related factors.

Keywords: Analysis, Attention, Clinical-Performance, Cochrane, Construct-Validity, Data Interpretation, Definitions, Design, Development, Flexible Cystoscopy, Guidelines, Implementation, Interpretation, Laparoscopic Cholecystectomy, Learning Procedural Skills, Literature, Measurement, Medical-Education, Model, Operating-Room Performance, Papers, Patients, Research, Researchers, Resection Trainer, Residents, Review, Science, Simulation, Surgery, Surgical, Teaching, Training, Ureteroscopy, Validation, Validity, Virtual-Reality Simulator, Web of Science

? Mi, J., Kang, Y.X., Chen, X.A., Wang, B.J. and Wang, Z.P. (2010), Whether robot-assisted laparoscopic fundoplication is better for gastroesophageal reflux disease in adults: A systematic review and meta-analysis. *Surgical Endoscopy and Other Interventional Techniques*, **24** (8), 1803-1814.

Full Text: [2010\Sur End Int Tec24, 1803.pdf](2010/Sur%20End%20Int%20Tec24,%201803.pdf)

Abstract: Although laparoscopic fundoplication is an effective, minimally invasive surgical technique for gastroesophageal reflux disease (GERD) that failed to be treated with medicine, with wide implementation its technical limitations have become increasingly clear. Recently, robot-assisted laparoscopic fundoplication (RALF) was considered a new approach that makes up for the deficiency of conventional laparoscopic fundoplication (CLF). This systematic review aimed to assess the feasibility and efficiency of robot-assisted laparoscopic fundoplication for GERD. Two reviewers independently searched and identified seven randomized controlled trials (RCTs) and four clinical controlled trials (CCTs) of RALF versus CLF for GERD in the Cochrane database, Medline, Embase, and Science citation index between 2001 and 2009. The main outcomes were operating time, complication rate, hospital stay, and costs. The meta-analysis was performed by Review Manager 5.0 software. The effect size of the clinical outcomes was evaluated by odds ratio (OR), weighted mean difference (WMD), and standard mean difference (SMD) according to different data type. Heterogeneity and sensitivity analysis were used to account for rationality of pooling data and sources of heterogeneity. Of 483 studies found, a total of 11 trials were included in this review, among 533 patients, 198 patients underwent RALF and 335 patients underwent CLF. The results of meta-analysis showed that the postoperative complication rate (OR = 0.35, 95% CI = [0.13, 0.93], p = 0.04) is lower for RALF, but the total operating time (WMD = 24.05, 95% CI = [5.19, 42.92], p = 0.01) is longer for RALF compared with those for CLF. Statistically, there was no significant difference between the two groups with regard to perioperative complication rate (OR = 0.67, 95% CI = [0.30, 1.48], p = 1.00) and length of hospital stay (WMD = 0.00, 95% CI = [-0.25, 0.26], p = 0.04). Systematic review of the literature indicates that RALF is a feasible and safe alternative to surgical treatment of GERD. However, since it lacks obvious advantages with respect to operating time, length of hospital stay and cost, RALF has limitations for its extensive application in clinics.

Keywords: Antireflux Surgery, Citation Index, Clinical-Trial, Difference, Follow-up, Fundoplication, Gastroesophageal Reflux Disease (GERD), Laparoscopy, Learning-Curve, Meta-Analysis, Nissen Fundoplication, Performance, Quality-of-Life, Randomized Controlled-Trial, Robot-Assisted, Systematic Review, Time

? Gong, B.A., Hao, L.X., Bie, L.K., Sun, B. and Wang, M. (2010), Does precut technique improve selective bile duct cannulation or increase post-ERCP pancreatitis rate? A meta-analysis of randomized controlled trials. *Surgical Endoscopy and Other Interventional Techniques*, **24** (11), 2670-2680.

Full Text: [2010\Sur End Int Tec24, 2670.pdf](2010/Sur%20End%20Int%20Tec24,%202670.pdf)

Abstract: There is no clear answer regarding use of precut technique versus conventional method in achieving successful biliary cannulation. To compare the effectiveness of precut technique with that of conventional biliary cannulation by meta-analysis of available randomized controlled trials (RCTs). Databases including MEDLINE, EMBASE, Cochrane Library, and Science Citation Index updated to July 2009 were searched. Main outcome measures were success rates of biliary cannulation, incidence of post-endoscopic retrograde cholangiopancreatography (ERCP) complications, and post-ERCP pancreatitis rate. Meta-analysis of these clinical trials was performed. Six RCTs were included. The primary biliary cannulation rate reported with precut and conventional techniques was 89.3 and 78.1%, respectively. Pooled analysis of all selected studies comparing precut cannulation technique with conventional techniques yielded an odds ratio (OR) of 2.05 [95% confidence interval (CI): 0.64-6.63]. Pooled analysis comparing post-ERCP pancreatitis rates for the precut-cannulation groups with those for the conventional-method groups yielded an rate ratio (RR) of 0.46 (95% CI: 0.23-0.92). This meta-analysis shows that the precut technique does not increase the primary cannulation rate. However, the technique reduces the risk of post-ERCP pancreatitis compared with conventional technique. Further large, well-performed, randomized controlled studies are needed to confirm these findings.

Keywords: Analysis, Cannulation, Citation, Common Bile Duct, Complications, Complications, Databases, Difficult Biliary Cannulation, Endoscopic Retrograde Cholangiopancreatography, ERCP, Medline, Meta-Analysis, Needle-Knife Fistulotomy, Papillotomy, Precut Endoscopic Biliary Sphincterotomy, Prospective Multicenter, Science Citation Index, Sphincterotomy, Therapeutic ERCP

? Butler, N., Collins, S., Memon, B. and Memon, M.A. (2011), Minimally invasive oesophagectomy: Current status and future direction. *Surgical Endoscopy and Other Interventional Techniques*, **25** (7), 2071-2083.

Full Text: [2011\Sur End Int Tec25, 2071.pdf](2011/Sur%20End%20Int%20Tec25,%202071.pdf)

Abstract: Background Oesophagectomy is one of the most challenging surgeries. Potential for morbidity and mortality is high. Minimally invasive techniques have been introduced in an attempt to reduce postoperative complications and recovery times. Debate continues over whether these techniques are beneficial to morbidity and whether oncological resection is compromised. This review article will analyse the different techniques employed in minimally invasive oesophagectomy (MIO) and critically evaluate commonly reported outcome measures from the available literature. Methods Medline, Embase, Science Citation Index, Current Contents, and PubMed databases were used to search English language articles published on MIO. Thirty-one articles underwent thorough analysis and the data were tabulated where appropriate. To date, only level III evidence exists. Where appropriate, comparisons are made with a meta-analysis on open oesophagectomy. Results Positive aspects of MIO include at least comparable postoperative recovery data and oncological resection measures to open surgery. Intensive care unit requirements are lower, as is duration of inpatient stay. Respiratory morbidity varies. Negative aspects include increased technical skill of the surgeon and increased equipment requirements, increased operative time and limitation with respect to local advancement of cancer. With increasing individual experience, improvements in outcome measures and the amenability of this approach to increasing neoplastic advancement has been shown. Conclusion MIO has outcome measures at least as comparable to open oesophagectomy in the setting of benign and nonlocally advanced cancer. Transthoracic oesophagectomy provides superior exposure to the thoracic oesophagus compared to the transhiatal approach and is currently preferred. No multicentre randomised controlled trials exist or are likely to come into fruition. As with all surgery, careful patient selection is required for optimal results from MIO.

Keywords: Cancer, Cervical Access, Citation, Comparative Studies, Databases, Esophagus, Experience, Hospitalisation, Human, Intraoperative Complications, Intrathoracic Anastomosis, Laparoscopic Transhiatal Esophagectomy, Laparoscopy, Literature, Meta-Analysis, Mobilization, Oesophageal Cancer, Oesophagectomy, Outcomes, Patient Outcome, Postoperative Complications, Prone Position, Prospective Studies, Pubmed, Retrospective Studies, Review, Science Citation Index, Thoracoscopic Esophagectomy

# Title: Surgical Innovation

Full Journal Title: Surgical Innovation

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Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cheng, T., Zhang, G.Y. and Zhang, X.L. (2011), Clinical and radiographic outcomes of image-based computer-assisted total knee arthroplasty: An evidence-based evaluation. *Surgical Innovation*, **18** (1), 15-20.

Abstract: Conventional instrumentation systems have limited accuracy in determining the crucial landmarks needed for alignment in total knee arthroplasty (TKA). Given this, the image-based navigation system was introduced to improve the accuracy of implantation of components into the femur and tibia. PUBMED, EMBASE, Web of Science, and Evidence-Based Medicine databases were electronically searched to identify eligible studies published until October 2008. A systematic review and meta-analysis of 6 randomized/quasi-randomized controlled trials that compared image-based navigation and conventional techniques was conducted. The operative time was longer in the navigation group in 3 studies. Moreover, there was a higher rate of achieving mechanical leg axis within the range of 3 degrees deviation in patients undergoing navigated TKA. However, all studies between the 2 groups were similar in range of motion, knee scores, and postoperative complication rates at the last follow-up. Overall, these short-term follow-up trials show that there were similar early clinical outcomes between image-based navigation and conventional techniques.

Keywords: Accuracy, Arthroplasty, Component, Computer-Assisted Surgery, Coronal Alignment, Databases, Embase, Evaluation, Follow-up, Knee, Leads, Meta Analysis, Meta-Analysis, Metaanalysis, Navigation, Navigation, Outcomes, Patients, Postoperative Alignment, Pubmed, Replacement, Review, Science, Systematic, Systematic Review, TKA, Total Knee Arthroplasty (TKA), Web of Science

# Title: Surgical Endoscopy-Ultrasound and Interventional Techniques

Full Journal Title: Surgical Endoscopy-Ultrasound and Interventional Techniques

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JCR Abbreviated Title: Surg Endosc-Ultras

ISSN: 0930-2794

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Journal Country Germany

Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

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? Dohmoto, M., Hunerbein, M. and Schlag, P.M. (1997), Application of rectal stents for palliation of obstructing rectosigmoid cancer. *Surgical Endoscopy-Ultrasound and Interventional Techniques*, **11** (7), 758-761.

Abstract: Background: The rationale of palliative endoscopic treatment is to avoid a colostomy in patients with advanced disease and Limited life expectancy. This study was conducted to evaluate the role of endoscopic stent implantation for palliation of obstructing rectal cancer. Methods: Overall, 19 patients (aged 47-87 years) with nonresectable or metastatic rectal cancer were treated by stent insertion after laser recanalization or dilation. Three types of stents, i.e., plastic tubes (n = 8), self-expanding mesh stents (n = 6), and endocoil stents (n = 5), were used to maintain luminal patency. Results: Endoscopic stent implantation was successfully performed in all 19 patients. Long-term luminal patency and satisfactory bowel function were achieved in 16 of 19 patients (84%). After a median follow-up of 6 months, eight of the patients have died and eight are still alive without evidence of recurrent, obstruction. Dislocation of the endoprosthesis occurred in two of eight plastic tubes and one of five mesh stents. Recurrent obstruction due to turner in grow th was only observed in patients treated with self-expanding mesh stents (n = 2). in spite of reinsertion and laser therapy a colostomy was required in three of 19 patients. There was no evidence of treatment failure in five patients who received endocoil stents. None of the patients experienced serious complications related to the endoscopic procedure. Conclusions: Endoscopic stent implantation seems to be a safe and efficient palliative approach to selected patients with obstructing rectal cancer. Currently, self-expanding coil stents are superior to other devices because of lower risk of dislocation and tumor ingrowth.

Keywords: Endoscopic Palliation, Rectal Cancer, Self-Expanding Metal Stent, Endoprosthesis, Recurrent Colorectal-Cancer, Metal Stents, Adenocarcinoma, Stricture, Fistulas

# Title: Surgical Oncology-Oxford

Full Journal Title: Surgical Oncology-Oxford

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Shehzad, K., Mohiuddin, K., Nizami, S., Sharma, H., Khan, I.M., Memon, B. and Memon, M.A. (2007), Current status of minimal access surgery for gastric cancer. *Surgical Oncology-Oxford*, **16** (2), 85-98.

Abstract: Background: The aim was to conduct a systematic review of the literature on the subject of laparoscopic gastrectomy (LG) and determine the relative merits of laparoscopic (LG) and open gastrectomy (OG) for gastric carcinoma. Material and methods: A search of the Medline, Embase, Science Citation Index, Current Contents and PubMed databases identified individual retrospective and prospective series on LG (proximal, distal and total). Furthermore, all clinical trials that compared LG and OG published in the English language between January 1990 and the end of December 2006 were also identified. A large number of outcome variables were analysed for individual series and comparative trials between LG and OG and results discussed and tabulated. Results: The majority of the literature is published from Japan showing both oncological adequacy and safety of LG. The majority of early series and comparative studies have utilized laparoscopic resection for early and distal gastric cancer. However, with increasing advanced laparoscopic experience, advancement in digital technology and improvement in instrumentation, more advanced gastric cancers and more extensive procedures such as laparoscopic-assisted total gastrectomy and laparoscopy-assisted D2 dissection are becoming more common. To date lymph node harvesting, resection margins and complication rates seem to be equivalent to open procedures. Furthermore, the earlier fears of port-site metastases have not been borne out. Conclusions: The available data suggests that LG seems to be associated with quicker return of gastrointestinal function, faster ambulation, earlier discharge from hospital, and comparable complications and recurrence rate to OG. However, the operating time for LG remains significantly longer compared to its open counterpart, although with experience it is achieving parity with OG. However, the majority of the comparative trials (if not all) probably do not have the power to detect differences in the outcome. As far as the RCT’s (LG vs. OG) are concerned, the numbers of patients in such trials are small and the majority of patients were operated upon for early distal gastric cancer and, therefore, any meaningful conclusions regarding the advantages or disadvantages of LG for both the ECGs and extensive and advanced gastric tumours are difficult to justify. (c) 2007 Elsevier Ltd. AR rights reserved.

Keywords: 5 Years Experience, Assisted Distal Gastrectomy, Billroth-I Gastrectomy, Cancer, Citation, Clinical Trials, Comparative Studies, Comparing Open, D2, Databases, Discharge, Elsevier, English, Gastrectomy, Gastric Cancer, Hospitalization, Human, Intraoperative Complications, Invasive Treatment, Language, Laparoscopic Method, Laparoscopic Surgery, Literature, Lymph-Node Dissection, Management, Medline, Metastasis, Methods, Patient’S Outcome, Postoperative Complications, Pylorus-Preserving Gastrectomy, Review, Science, Science Citation Index, Surgery, Systematic Review, Technology

# Title: Survey Review

Full Journal Title: Survey Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chandler, J.H. (2000), What is ISI and why is it important? *Survey Review*, **35** (277), 505-508.

Abstract: In March 2000 the senior editor of ISI (Institute of Scientific Information) informed the Survey Review that it had been decided to index the journal as part of the ISI product range, commencing with the January 2000 issue. This generated the response amongst the Editorial Board “I think that this is positive, but does anybody know what this means?” The aim of this short review is to demonstrate that this development is indeed positive and to clarify why. I was asked to write this article because I had supported Keith Atkinson in the successful campaign to get the Photogrammetric Record re-instated in early 1999 and I had raised the issue at the Teachers of Surveying conference held in 1998. The article will outline the philosophy behind ISI and review the recent Web of Science product, before attempting to answer why inclusion in the ISI membership is important, particularly for academic readers.

Keywords: Development, ISI, Journal, Review, Science, Scientific Information, Web of Science

# Title: Surveys in Industrial Wastewater Treatment Manufacturing and Chemical Industries

Longman Scientific and Techical, Harlow New York

Kiff, R.J. (1987), General inorganic effluents. in *Surveys in Industrial Wastewater Treatment Manufacturing and Chemical Industries*, (Edited by Barnes, D., Forster, C.F. and Hrudey, S.E.), Longman Scientific and Techical, Harlow New York.

# Title: Sustainability Science

Full Journal Title: [Sustainability Science](http://www.springerlink.com/content/120154/?p=7615e2766ffa4b458a77408d73f522da&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Yarime, M., Takeda, Y. and Kajikawa, Y. (2010), Towards institutional analysis of *Sustainability Science*: A quantitative examination of the patterns of research collaboration. *Sustainability Science*, **5** (1), 115-125.

Full Text: [2010\Sus Sci5, 115.pdf](2010/Sus%20Sci5,%20115.pdf)

Abstract: This paper examines quantitatively the patterns of collaboration over geographical boundaries in the emerging field of sustainability science by empirically analyzing the bibliometric data of scientific articles. The results indicate that an increasing number of countries are engaged in research on sustainability, with the proportion of articles published through international collaboration rising as well. The number of countries engaged in international collaboration on sustainability research has been increasing, and the diversity of countries engaged in research collaboration beyond national borders is also increasing. The geographical patterns of collaboration on sustainability show that research collaboration tends to be conducted between countries which are geographically located closely, suggesting that communication and information exchange might be limited within the regional clusters. The focused fields of research activities on sustainability are significantly different between countries, as each country has its focused fields of research related to sustainability. The specialization of research activities is also observed in international collaboration. While these patterns of international collaboration within regional clusters focusing on specific fields could be effective in promoting the creation, transmission, and sharing of knowledge on sustainability utilizing the already existing regional networks, they could pose a serious obstacle to collecting, exchanging, and integrating diverse types of knowledge, especially when it is necessary to deal with problems involving large-scale complex interactions with long-term implications, such as climate change. It would be of critical importance to establish inter-regional linkages by devising appropriate institutional arrangements for global research collaboration on sustainability science.

Keywords: Bibliometrics, Institutional Analysis, Management, Networks, Research Collaboration, Sustainability Science

? Schoolman, E.D., Guest, J.S., Bush, K.F. and Bell, A.R. (2012), How interdisciplinary is sustainability research? Analyzing the structure of an emerging scientific field. *Sustainability Science*, **7** (1), 67-80.

Full Text: [2012\Sus Sci7, 67.pdf](2012/Sus%20Sci7,%2067.pdf)

Abstract: Sustainability research is expected to incorporate concepts, methods, and data from a diverse array of academic disciplines. We investigate the extent to which sustainability research lives up to this ideal of an interdisciplinary field. Using bibliometric data, we orient our study around the “tripartite model” of sustainability, which suggests that sustainability research should draw from the three “pillars” of the environmental, economic, and social sciences. We ask three questions: (i) is sustainability research truly more interdisciplinary than research generally, (ii) to what extent does research grounded in one pillar draw on research from the other two, and (iii) if certain disciplines or pillars are more interdisciplinary than others, then what explains this variation? Our results indicate that sustainability science, while more interdisciplinary than other scientific fields, falls short of the expectations inherent in the tripartite model. The pillar with the fewest articles published on sustainability-economics-is also the most integrative, while the pillar with the most articles-environmental sciences-draws the least from outside disciplines. But interdisciplinarity comes at a cost: sustainability research in economics and the social sciences is centered around a relatively small number of interdisciplinary journals, which may be becoming less valued over time. These findings suggest that, if sustainability research is to live up to its interdisciplinary ideals, researchers must be provided with greater incentives to draw from fields other than their own.

Keywords: Academia, Bibliometric, Citation Analysis, Citation Analysis, Discipline, Ecological Economics, Economics, Environmental, Falls, Global Environmental-Change, Human Dimensions, Incentives, Indicators, Interdisciplinarity, Journal Maps, Journals, Model, Modern Science, Research, Researchers, Scholarly Networks, Science, Sciences, Social, Social Sciences, Sustainability Science, Sustainable, Vulnerability

# Title: Swiss Medical Weekly

Full Journal Title: Swiss Medical Weekly

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country/Territory:

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Publisher:

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Subject Categories:

: Impact Factor

? Schaffner, A. (2004), Where we are-where we are heading. *Swiss Medical Weekly*, **134** (1-2), 3.

Full Text: [2004\Swi Med Wkl134, 3.pdf](2004/Swi%20Med%20Wkl134,%203.pdf)

? Bossi, E. (2010), Scientific integrity, misconduct in science. *Swiss Medical Weekly*, **140** (13-14), 183-186.

Full Text: [2010\Swi Med Wkl140, 183.pdf](2010/Swi%20Med%20Wkl140,%20183.pdf)

Abstract: Many scientists consider scientific integrity to be a self-evident basic moral attitude. They are of the honest opinion that scientific misconduct is very rare and they also cannot imagine that it could in fact occur in their own institutions. However, this opinion must be considered in the light of international experience in this respect. There are still many examples of scientific misconduct. Striking examples are taken up by the media, such as the South Korean case of pretended successful cloning of human blastocytes, from which embryonal stem cells were said to have been cultured and which in fact proved to be the result of a hoax [1], or the “proof”, from Norway, that antiinflammatory drugs reduce the incidence of cancer of the mouth, which was in fact based on totally fictitious data [2]. Switzerland is also involved. A very special example is the case of a theological ethicist who was accused of plagiarism at the University of Geneva In The US Office of Research Integrity regularly publishes new medical cases in its newsletters [4]. The following text is based on, among other things, the guidelines published by the Swiss Academies of Sciences to provide research institutions, their students and their personnel with an overview of the subject. These guidelines, under the title “Scientific Integrity. Principles and Procedures”, were drawn up by a working group of the four scientific academies and published in 2008 [5].

Keywords: Cancer, Misconduct, Overview, Plagiarism, Research, Scientific Integrity, Scientific Misconduct, Students, University, US

# Title: Swiss Political Science Review

Full Journal Title: [Swiss Political Science Review](http://web.ebscohost.com/ehost/detail?hid=111&sid=6ccb4eac-8673-4052-b453-fcda0ff7a8f4%40sessionmgr113&vid=1&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=eoh&jid=24O8)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bernauer, T. and Gilardi, F. (2010), Publication output of Swiss political science departments. *Swiss Political Science Review*, **16** (2), 279-303.

Full Text: [2010\Swi Pol Sci Rev16, 279.pdf](2010/Swi%20Pol%20Sci%20Rev16,%20279.pdf)

Abstract: This article compares the scientific publication output and international academic visibility of Swiss political science departments, using three indicators (number of publications, number of citations, and the h-index) and publicly available data from two sources: the Web of Knowledge and Google Scholar. We also examine whether the publication output of political science professors and postdoctoral researchers in Switzerland varies as a Junction of academic age. We observe rather strong variations both across and within departments. The analysis also shows that the most prolific professors tend to be those who completed their Ph.D. about 10-20 years ago and that some postdocs are on a very promising publications trajectory. We derive some benchmarks for publication output that might be useful for hiring decisions or promotions.

Keywords: Analysis, Bibliometric Analysis, Citations, Data, Google Scholar, h Index, h-Index, Indicators, Journals, Knowledge, Number of Publications, Output, Publication, Publication Output, Publications, Researchers, Science, Swiss Political Science, Switzerland, Web of Knowledge

# Title: Symposium-A Quarterly Journal in Modern Literatures

Full Journal Title: Symposium-A Quarterly Journal in Modern Literatures

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Daniels, T.T. (2008), Michel Butor’s mobile: Modernism, postmodernism, and American art. *Symposium-A Quarterly Journal in Modern Literatures*, **62** (2), 99-112.

Full Text: [2008\Sym-Qua J Mod Lit62, 99.pdf](2008/Sym-Qua%20J%20Mod%20Lit62,%2099.pdf)

Abstract: The author examines Michel Butor’s Mobile (1962) in relation to the Visual arts, beginning with a discussion of connections to modernist Visual models found in the works of Alexander Calder, Jackson Pollock, and Marcel Duchamp. In comparing the text with Boomerang and with the poetic essay Comment ecrire pour Jasper Johns, written nearly thirty years later, the author demonstrates how Butor encourages a rereading of his early work through the recycling of certain motifs. Furthermore, the author studies the similarities that Butor identifies between his writing and Johns’s art, notably through the co-opting Of Popular imagery and the practice of self-citation. The author argues that Butor’s texts are best understood as “postmodern” works grounded in an intellectual heritage based on modernism and Duchampian aesthetics.

Keywords: Author, Boomerang, Jasper Johns, Marcel Duchamp, Michel Butor, Mobile, Modernism, Postmodern, Self-Citation

# Title: Symposium on Surface Mining, Hydrology, Sedimentology and Reclamation (University of Kentucky, Lexington, Kentucky)

Lapakko, K. and Eger, P. (1981), Trace metal removal from mining stockpile runoff using peat, wood, chips, tailings, till and zeolite. *Symposium on Surface Mining*, *Hydrology*, *Sedimentology and Reclamation* (University of Kentucky, Lexington, Kentucky), 105-116.

Kleinmann, R.L.P., Tiernan, T.O., Solch, J.G. and Harris, R.L. (1983), A low-cost, low-maintenance treatment system for acid mine drainage using sphagnum moss and limestone. *Symposium on Surface Mining*, *Hydrology*, *Sedimentology and Reclamation* (University of Kentucky, Lexington, Kentucky), 241-245.

Tarleton, A.L., Lang, G.E. and Wieder, R.K. (1984), Removal of iron from acid mine drainage by sphagnum peat: Results from experimental laboratory microcosms. *Symposium on Surface Mining*, *Hydrology*, *Sedimentology and Reclamation* (University of Kentucky, Lexington, Kentucky), 413-420.

# Title: Symposium Wetlands/Peatlands

Viraraghavan, T., Mathavan, G.N. and Rana, S.M. (1987), Use of peat in wastewater treatment. in *Symposium Wetlands Peatlands* (Edited by Rubec, C.D.A. and Overend, R.P.) Wetland/Peatlands, Ottawa, Canada, 225-232.

# Title: Synthesis Philosophica

Full Journal Title: Synthesis Philosophica

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kuhn, H.C. (2006), Counting what may count regionally - The presence of prints of works by Frane Petric in German libraries. *Synthesis Philosophica*, **21** (1), 139-159.

Full Text: [2006\Syn Phi21, 139.pdf](2006/Syn%20Phi21,%20139.pdf)

Abstract: Using bibliographical data from the major electronic German libraries’ catalogues for the editions of the works by Frane Petric, and the copies of these works, it is possible to arrive at results which probably cannot be obtained using other means and instruments. There are strong indicators that the pre-20th century German reception of Petric differs considerably from his reception elsewhere (especially in the U.K.). In this phase of reception the impact of the Discussiones peripateticae and the Militia romana is particularly conspicuous. The results for the impact of the 1953 sqq editions of Petric’s works are under many aspects different from the results obtained for the earlier editions of his works. This is a preliminary case study for Germany, using data from the U.K. and from the AHCI database for comparisons.

Keywords: Bibliographical Data, Counting, Frane Petric, Impact

# Title: Synthetic Metals

Full Journal Title: Synthetic Metals

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ai, L.H., Jiang, J. and Zhang, R. (2010), Uniform polyaniline microspheres: A novel adsorbent for dye removal from aqueous solution. *Synthetic Metals*, **160** (7-8), 762-767.

Full Text: [2010\Syn Met160, 762.pdf](2010/Syn%20Met160,%20762.pdf)

Abstract: Uniform polyaniline (PANI) microspheres were synthesized by a facile polymerization of aniline monomer in the acidic medium. The structure and morphology of PANI microspheres were characterized by means of FTIR spectrometer, X-ray diffractometer (XRD), scanning electron microscope (SEM) and transmission electron microscope (TEM). Adsorption characteristics of PANI microspheres were examined using methyl orange (MO) as adsorbate. Batch adsorption experiments were carried out to investigate adsorption kinetics and isotherms of PANI microspheres. Adsorption equilibrium studies showed that MO adsorption followed Freundlich model. The adsorption kinetics was best described by pseudo-second-order model. The results indicated that PANI microspheres can be used as a novel. effective and low-cost adsorbent material for dye removal. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Adsorption Kinetics And Isotherms, Aqueous Solution, Batch Adsorption, Cationic Dyes, Characteristics, Dye, Dye Removal, Equilibrium, Equilibrium Studies, Experiments, Facile Synthesis, Freundlich, Freundlich Model, FTIR, Isotherms, Kinetics, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Methyl Orange, Methylene-Blue, Microparticles, Microsphere, Microspheres, Mo, Model, Morphology, Pani, Polyaniline, Polymerization, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, SEM, Solution, Sorption, Structure, Tem, Transmission, Water, X-Ray, XRD

# Title: Systemic Practice and Action Research

Full Journal Title: Systemic Practice and Action Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bell, S. and Flood, R.L. (2011), Fair and open approach to academic publishing. *Systemic Practice and Action Research*, **24** (6), 499-503.

Full Text: [2011\Sys Pra Act Res24, 499.pdf](2011/Sys%20Pra%20Act%20Res24,%20499.pdf)

Abstract: The Journal Systemic Practice and Action Research (SPAR) aims to encourage into print authors and practitioners of systemic thinking and practice from all kinds of background. In this note we describe both the publishing world into which SPAR has emerged and the systemic and inclusive thinking behind the journal’s publishing policy. We set out our manifesto for a fair and open approach to academic publishing. “A rich and diverse set of potential bibliometric and scientometric predictors of research performance quality and importance are emerging today-from the classic metrics (publication counts, journal impact factors and individual article/author citation counts) to promising new online metrics such as download counts, hub/authority scores and growth/decay chronometrics. In and of themselves, however, metrics are circular: They need to be jointly tested and validated against what it is that they purport to measure and predict, with each metric weighted according to its contribution to their joint predictive power. The natural criterion against which to validate metrics is expert evaluation by peers; a unique opportunity to do this is offered by the 2008 UK Research Assessment Exercise, in which a full spectrum of metrics can be jointly tested, field by field, against peer rankings.” (Harnard 2008).

Keywords: Academic Publishing, Assessment, Authors, Bibliometric, Citation, Citation Counts, Contribution, Evaluation, Exercise, Impact, Impact Factors, Joint, Journal, Journal Impact, Journal Impact Factors, Metrics, Natural, Policy, Power, Practice, Predictors, Publication, Publishing, Quality, Research, Research Performance, UK

# Title: Systems Analysis Modelling Simulation

Full Journal Title: [Systems Analysis Modelling Simulation](http://taylorandfrancis.metapress.com/(k51a1i55xwfxf555epfpsm45)/app/home/journal.asp?referrer=parent&backto=linkingpublicationresults,1:104286,1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bartel, H.G. (1991), A modified Kretschmer Complexity Index for selecting end partitions in cluster-analysis. *Systems Analysis Modelling Simulation*, **8** (2), 139-145.

Abstract: An index introduced by H. KRETSCHMER [5, 6] in scientometrics for describing relations of scientific communications was modified and used to select end partitions in cluster analysis which are associated with a minimum of complexity in the system of classes. Such partitions are favoured for the interpretation of initial information given by a data matrix. Using theory of sets an algorithm was developed to compare these (and other) selected end partitions and to construct generalized classes without restriction of their number. So it is possible to obtain a high degree of information from a data matrix. The approach was applied to chemical property-structure-relations (physical properties, electronic structure, topology, state of aggregation, number of atoms).

Keywords: Cluster, Cluster Analysis, Scientometrics, Solvents, Spectra, System

# Title: Systems, Organizations and Management: Proceedings of the 3rd Workshop of International Society in Scientific Inventions

Full Journal Title: Systems, Organizations and Management: Proceedings of the 3rd Workshop of International Society in Scientific Inventions

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Pei, R.M., Song, Z. and Gao, P. (2009), Analysis of knowledge management based on science knowledge mapping. *Systems, Organizations and Management: Proceedings of the 3rd Workshop of International Society in Scientific Inventions*, 180-186.

Abstract: Knowledge management is becoming the popular organization practice. Although much work has done to summarize the knowledge management development, less has done using the quantitative way. Utilizing scientometrics approaches, this paper studies the central issues of knowledge management from 2004 to present, analyzes the front and hotspot of the knowledge management objectively, and provides the direction for the future study in this domain.

Keywords: Co-Word Analysis, Knowledge Management, Network, Science, Science Knowledge Mapping, Scientometrics, System, Systems, Visualization

# Title: System Familie

Full Journal Title: System Familie

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Reiter, L. (1993), Scientific status as dynamic system - Bibliometric study on 3 systems journals. *System Familie*, **6** (4), 246-249.

Keywords: Bibliometric

# Title: Systems Research and Behavioral Science

Full Journal Title: Systems Research and Behavioral Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? Eom, S.B. (2000), The contributions of systems science to the development of the decision support system subspecialties: An empirical investigation. *Systems Research and Behavioral Science*, **17** (2), 117-134.

Abstract: This is a comprehensive study that, by means of an empirical assessment of the decision support systems (DSS) literature over the Fast 23 years (1971-1993), systematically identifies the DSS reference disciplines and traces how concepts and findings by systems researchers have been picked up by DSS researchers to be applied, extended and refined in the development of DSS research subspecialties. Cluster analysis was applied to an author cocitation frequency matrix derived from a comprehensive database of the DSS literature to uncover 12 clusters consisting of six major areas of DSS research (foundations, group DSS, model management, user interfaces, implementation and multicriteria DSS) and six contributing disciplines (multiple-criteria, decision-making, cognitive science organization science, artificial intelligence, group decision-making and systems science). This study concludes that systems scientists have made important contributions to the development of foundational concepts, implementation, user interface, model management and group decision support systems. Copyright (C) 2000 John Wiley & Sons, Ltd.

Keywords: Analysis, Artificial Intelligence, Assessment, Author Cocitation Analysis, Bibliometrics, Cluster Analysis, Cocitation, Cognitive-Style, Complexity, Computer Support, Consequences, Database, Decision Making, Decision Support Systems, Development, Dss, Information Systems, Information-Systems, Integration, Intellectual Structure, Intellectual Structure, Intelligence, Literature, Management, Management Information Systems, Model Management-Systems, Reference, Reference Disciplines, Representation, Research, Researchers, Science, System, Systems Approach, Systems Science

# Title: Systematic and Applied Microbiology

Full Journal Title: [Systematic and Applied Microbiology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=20442&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=26d15354218a60da6ec944841c48d921)

ISO Abbreviated Title: Syst. Appl. Microbiol.

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Language: Multi-Language

Publisher: Gustav Fischer Verlag

Publisher Address: Villengang 2, D-07745 Jena, Germany

Subject Categories:

Biotechnology & Applied Microbiology Microbiology: Impact Factor

Cotter, C. and Trevors, J.T. (1988), Copper adsorption by *Escherichia coli*. *Systematic and Applied Microbiology*, **10**, 313-317.

? Behr, T., Koob, C., Schedl, M., Mehlen, A., Meier, H., Knopp, D., Frahm, E., Obst, U., Schleifer, K.H., Niessner, R. and Ludwig, W. (1988), A nested array of rRNA targeted probes for the detection and identification of enterococci by reverse hybridization. *Systematic and Applied Microbiology*, **23** (4), 563-572.

Abstract: Complete 23S and almost complete 16S rRNA gene sequences were determined for the type strains of the validly described *Enterococcus* species, Melissococcus pluton and Tetragenococcus halophilus. A comprehensive set of rRNA targeted specific oligonucleotide hybridization probes was designed according to the multiple probe concept. In silico probe design and evaluation was performed using the respective tools of the ARB program package in combination with the ARE databases comprising the currently available 16S as well as 23S rRNA primary structures. The probes were optimized with respect to their application for reverse hybridization in microplate format. The target comprising 16S and 23S rDNA was amplified and labeled by PCR (polymerase chain reaction) using general primers targeting a wide spectrum of bacteria. Alternatively, amplification of two adjacent rDNA fragments of enterococci was performed by using specific primers. In vitro evaluation of the probe set was done including all *Enterococcus* type strains, and a selection of other representatives of the gram-positive bacteria with a low genomic DNA G+C content. The optimized probe set was used to analyze enriched drinking water samples as well as original samples from waste water treatment plants.

Keywords: 16S rRNA, 23S rRNA, Enterococci, Microplates, Reverse Hybridization, Specific Probes, 16s Ribosomal-RNA, Plate Hybridization, Bacteria, PCR, Phylogeny, Sequences, System, Food, rDNA